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KNOWLEDGE ORGANIZATION AND INSTRUCTIONAL SYSTEMICS: A PROBLEM IN THE EPISTEMOLOGY OF CURRICULUM

by

ANDREW SAMUEL HUGHES

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled "Knowledge Organization and Instructional Systemics: A Problem in the Epistemology of Curriculum" submitted by Andrew Samuel Hughes in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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In Memorium

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ABSTRACT

The study was designed to provide for an empirical examination of the assumption implicit in much curriculum discourse that there exists a relationship between the manner in which knowledge is organized for instruction and the properties exhibited by the instructional system in which it is situated. Conducted within the framework of an abstracted instructional system, educational knowledge codes of the integrated and collection types were designated as the modes of knowledge organization to be investigated. The dimensions of classroom experience (systemic elements) posited as existing in a relationship with the knowledge code employed were: (a) instructional intent, (b) the condition of "knowing that," (c) the form of inquiry, (d) the paradigm of activity, and (e) instructional resonance. A major research hypothesis and five sub-hypotheses were formulated to guide the study.

In order to test the hypotheses five distinct and independently conducted case studies were carried out. In each case study the "instructional systemics" of a class employing an integrated code were compared with those of a class employing a collection code. Data were collected by trained observers using the System for Analyzing Classroom Transactions, and by means of the Instructional Resonance Questionnaire. Both instruments were developed specifically for the purposes of the study.

Observational data were subjected to chi-square analysis and questionnaire data to t-test analysis.

The study resulted in no evidence to suggest that (a) the instructional intent, (b) the conditions of "knowing that," or (c) the instructional resonance, obtaining in any instructional situation, are in any way related to the knowledge code employed, i.e., the relationships are best described as independent. There was some evidence to suggest that the form of inquiry and the paradigm of activity obtaining in an instructional situation, may be related to the knowledge code employed, i.e., the relationships tended toward interdependence. The findings pertaining to form of inquiry and paradigm of activity, however, were by no means conclusive.

Viewed from a systems perspective the findings of the study indicate that statements of a general nature asserting the existence of a relationship between the educational knowledge code employed in an instructional situation, and the general systemic configuration are unwarranted. For some dimensions of classroom experience the relationship tends toward independence, for others the tendency is toward interdependence.

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Chapter 1

INTRODUCTION

The problem of how to best organize knowledge for the purpose of instruction is one which has been perennially puzzling for the curriculum scholar. Whether the structure of the curriculum should reflect a separate-subject organization of knowledge, or the more encompassing "forms" of knowledge, or perhaps deny the existence of categories of knowledge, or whether indeed the curriculum should reflect some other manner of organizing knowledge for instruction, are among the questions to be confronted continually. However, while the choices available have obviously been numerous, the school curriculum, particularly at the secondary school level, has traditionally reflected a separate-subjects approach to organizing knowledge for instruction, perhaps more through inertia than through rational selection. Indeed, it would seem that "disciplines . . . have been reified and institutionalized to such an extent that in curriculum planning we have difficulty thinking beyond them [Wise, 1966, p. 400]."

From time to time, however, there have arisen challenges to the traditional organization, challenges which have resulted in curricula frequently characterized as interdisciplinary or integrated. Such curricula have

tended to be varied. They possess in common only the negative attribute of opposition to subject divisions or subject barriers as these are traditionally conceived (Pring, 1973, p. 59). Their opposition is founded in the belief that the separate-subject curriculum fosters "a fatal disconnection [Caswell, 1962, p. 108]," that it "fragments a student's world view [Fraenkel, 1970, p. 376]," and that it results in "the creation of a mind torn against itself [Wise, 1966, p. 392]." These outcomes, it is claimed, being the results of the "artificial barriers [Salt, 1969, p. 23]," "separate compartments [Taylor, 1970, p. 69]," and the "artificially circumscribed packages of information [Kerr, 1968, p. 26]" which characterize the separate-subject curriculum. Implicit in the argument is the belief that any curricular organization of knowledge which diminishes the strength of the barriers between subjects will inevitably promote the opposite and more desirable effects by permitting the student exposure to the "full dimensional learning experience [Marashio, 1971, p. 252]."

For the most part, however, the assertions represent expressions of a valuative stance rather than conclusions based upon evidence. By and large it is ignored that, to the present time, it has not been demonstrated that there is any "a priori theoretical advantage of interdisciplines over disciplines, no matter how we slice

them [Cameron, 1965, pp. 309-310]." Nor has it been shown that there is any "empirical evidence to justify any type of discipline curriculum selection and organization—single, correlated or multidisciplinary, broad, unified, fused or interdisciplinary—as compared with another [Rice, 1973, p. 11]." Furthermore, it has been suggested that it does not matter very much which knowledge organization is chosen since children can learn, no matter how the curriculum is packaged (Arnstine, 1967, p. 359).

Nevertheless, the literature remains full of the polemics of curriculum organization, all of it based on the assumption that the manner in which knowledge is organized for instruction does, in some measure, constrain the possibilities afforded by any instructional situation, with the resulting learning experiences being different in their major characteristics (Faix, 1964, p. 224; Montebello, 1965, p. 71).

It was the purpose of the research reported here to subject this assumption to examination.

THE PROBLEM

Does there exist a relationship between the manner in which knowledge is organized for instruction and the properties exhibited by the instructional system in which it is situated? Essentially the task is one of determining whether a student's learning experience is likely to differ

in any of its major characteristics as the result of being exposed, in an instructional situation, to one type of knowledge organization as opposed to another.

DELIMITATION OF THE PROBLEM

Organizing Knowledge for Instruction

The importance of knowledge in the educative process has been emphasized in one way by Scheffler (1965) who points out that "the development and transmission of knowledge are fundamental tasks of education [p. 1]." However, the importance of knowledge may be seen to lie not only in that it is an end to be achieved, but also in the fact that it is instrumental in achieving both these and other ends, the latter being the propensities and dispositions often referred to generally as affect.

It can readily be seen that there are a number of possible ways in which knowledge may be organized so as to help the individual create meaning out of the anarchy of events, the "blooming, buzzing confusion" of Whitehead. There is that organization reflected in the divisions of the Comtian hierarchy and based upon "subject matter," or that based upon Plato's divided line or Aristotle's four causes. More recently there is that organization found in Tykociner's (1964) zones and areas of knowledge, Hirst's (1965) fields and forms, Phenix's (1964) realms of meaning, and Clarke's (1972) general ecology of knowledge.

If knowledge may be taken as an organization which a community of experiencers places upon the representations of selected subsets of their shared experiences, then the structures referred to above, i.e., the Comtian hierarchy etc., should be regarded as a second order knowledge, a second order organization of events. Such structures represent a categorization of previously and independently existing and recognized facts, concepts, generalizations, models and theories which may be regarded as constituting knowledge of the first order. It is knowledge of this first order which may be further organized so as to constitute a curriculum, the latter being defined stipulatively as knowledge organized for the purposes of instruction.

Recognizing that there are a number of possible ways in which knowledge may be organized, the curriculum builder is faced with the problem of deciding which organization or organizations to select for the purposes of instruction. The task would appear to involve a number of difficulties. J. B. Macdonald (1965), for example, has been at pains to point out that

> Structure [organization] is an after the fact description of the way knowledge can be organized by mature scholars. It is not the basis from which the knowledge itself was developed. Further, as a coherent way of organizing a field of knowledge, it does not necessarily follow that this is the way to organize in the instructional setting [p. 575].

The same point had been made previously by Dewey (1963),

and was later augmented by Cameron (1965) who claimed that "the fact that distinguished scholars may combine mathematics with medicine with social theory does not mean that sophomores can profitably begin by doing so [p. 311]."

However, while a wide variety of possibilities for knowledge organization is available to curriculum designers, the choice, in effect, has been historically limited to two, both employing subject matter as reflected in the Comtian hierarchy as the criterion of categorization. Indeed the predominance of these two choices has been so evident in curriculum design that it can be suggested that there are two ideal-typical ways in which knowledge may be organized so as to constitute a curriculum. These have been referred to by Bernstein (1971) as educational knowledge codes of the collection type and the integrated type (p. 49).

In order to explicate the nature of the codes Berstein employs the concept of "classification." Classification, he points out

> . . . does not refer to what is classified, but to the relationships between contents. Classification refers to the nature of the differentiation between contents. Where classification is strong, contents are well insulated from each other by strong boundaries. Where classification is weak, there is reduced insulation between contents for the boundaries between contents are weak or blurred. Classification thus refers to the degree of boundary maintenance between contents [p. 49].

Where classification is strong, i.e., where contents are clearly bounded and well insulated, standing in a closed

relation to each other, the knowledge code is of a collection type. Where contents stand in an open relation to each other, with weak or non-existent boundaries, the knowledge code is of an integrated type.

A collection code of the ideal type would appear to exist where a curriculum consists solely of subjects each of which corresponds to a recognized discipline. An integrated code of the ideal type would exist where previously insulated subjects are subordinated to a relational idea which blurs the boundaries between them. Clearly, however, the ideal states rarely obtain in the existential situation. Nevertheless, it is possible to observe various forms of collection, and various forms and degrees of integration. For example, some measure of integration can be recognized where "knowledge is grouped for pedagogical purposes in four major categories—the natural sciences, the social sciences, mathematics and the humanities [Bellack, 1965, p. 323]." A total curriculum organized in this fashion, however, is rare, but a partial representation is frequently found where the individual social sciences receive consideration as "social studies," the individual identity of each discipline being subordinated to a major relational idea, i.e., the need to explain man's social life.

By comparing the properties of instructional systems (i.e., the instructional systemics) employing

variously the "social studies" and the separate social science subjects, it was hoped to provide an empirical base from which to view the broader problem. The "social studies" and the separate social science subjects were viewed in this study as representing a special case of the general phenomenon.

Defining the Instructional System

It will be appreciated that in any real instructional situation there is in operation no less than an infinite number of variables (systemic elements). However, for the purposes of any given research only a limited number may be subjected to examination. The researcher is charged with the responsibility of abstracting a set of significant variables from the infinity of possibilities. It is this set which, in any given instance, comprises the system (Ashby, 1960, p. 15).

The elements of the instructional system subjected to examination in this research, in addition to the knowledge code already referred to, were: (a) the instructional intent, (b) the conditions of "knowing that," (c) the form of inquiry, (d) the paradigm of activity, and (e) the instructional resonance. Each of these elements constitutes a significant dimension of the instructional process in any classroom, and the social studies or social science classroom in particular. (A

discussion of the educational significance of these elements comprises part one of Chapter 3 of this report.)

Definitions

The definition of terms provided here is largely conceptual in nature. The operational and empirical referents of the concepts are discussed in Chapter 4 which deals with procedures, and in the booklet pertaining to the System for Analyzing Classroom Transactions (Appendix A).

Instructional intent. A distinction is frequently drawn in education between those intended learning outcomes which emphasize process and those which emphasize product (Parker and Rubin, 1966), between skills and content (Gallagher, 1967), between what Gilbert Ryle (1949, 1966) referred to as knowing how and knowing that. It is the distinction implicit in these dichotomies which is emphasized in that element of the system named "instructional intent." Where the intent of the instruction is that the student will develop a behavior or competence it is referred to as knowing how. Where the intent of the instruction is that the student will acquire information, it is referred to as knowing that.

The conditions of "knowing that." The state of "knowing that," sometimes referred to as propositional knowledge (Scheffler, 1965, p. 10), may be viewed as obtaining either

in a weak sense or in a strong sense (Hintikka, 1962, pp. 18-19). In the weak sense, "knowing that" depends only upon a condition of true belief, i.e., truly believing that something is the case. In the strong sense, "knowing that" requires not only a condition of true belief, but also the provision of evidence to support that belief. It is this distinction between "knowing that" in its strong and weak senses which is implicit in the notion of "the conditions of knowing that." Where the nature of a classroom transaction is such that there is an exchange of "knowledge" based only upon a condition of true belief, it is described as knowing that in the weak sense. Where ideas or opinions are supported by evidence so that a condition of warranted belief exists, it is described as knowing that in the strong sense.

The forms of inquiry. The idea of forms of inquiry employed in this study is derived largely from the work of Charles Morris (1964). He suggested that there are essentially three main types of problem to which inquiry may be directed. First, the problems of what has happened, is happening, or will happen; second, problems of what to do; and third, problems of what to accord preferential behavior. Inquiry of the first type is named designative, the second prescriptive, and the third appraisive.

While a conceptual distinction may be clearly drawn between prescriptive and appraisive inquiry, it must also be recognized that they both demand a process of valuing, a process which is not an attribute of designative inquiry. For this reason it is possible to regard prescriptive and appraisive inquiry as collectively constituting evaluative inquiry as opposed to the non-evaluative character of designative inquiry.

Where the process of inquiry in an instructional situation exhibits the attribute of valuing it is termed evaluative inquiry. Where the process is solely designative in its attributes it is referred to as non-evaluative inquiry.

The paradigm of activity. Teachers and students in any instructional situation may be regarded as existing in a state of co-action or transaction. The notion of paradigm of activity is employed to characterize the nature of that transaction which develops between teachers and students. When the dominant pattern of transaction is such that the locus of decision-making lies with the teacher, the instruction is described as teacher-centered. When the pattern is such that the locus of decision-making lies neither exclusively with the teacher nor with the students, and decisions affecting what will transpire in the classroom emerge as the result of co-operation on the part of students and teacher, the instruction is described as

group-regulated (Hughes, 1974).

The concern with a dominant pattern of transaction reflected in this part of the study is, of course, an extension of a tradition of classroom research which focuses upon patterns of leadership which are normally defined in terms of a hypothetical authoritarian-democratic dimension (Anderson, 1959).

Instructional resonance. The reaction of students to selected aspects of their classroom experience may be described using the concept of instructional resonance which may be conceived of as consisting of the sub-concepts of relevance resonance, intellectual resonance, and experiential resonance. When a student perceives his classroom experience as contributing significantly to the achieving of his goals a high degree of relevance resonance obtains. When a student does not perceive his experience as contributing significantly to the achieving of his goals a low degree of relevance resonance obtains. The sub-concept of intellectual resonance is employed to describe the extent to which a classroom experience, or set of experiences, is perceived by a student to be appropriate to his intellectual level. When an experience is such that it demands a level of intellectual activity which is regarded by the student as being too easy or too difficult, a condition of low intellectual resonance obtains. When the student views the experience as

requiring an appropriate level of intellectual activity then a condition of high intellectual resonance obtains. The third dimension of instructional resonance is experiential resonance and refers to the capacity of the student to see the importance of the subject matter being studied. When the subject matter is perceived as important a high degree of experiential resonance obtains. When it is perceived as being of little or no importance a low degree of experiential resonance obtains. Collectively the three resonances provide a measure of instructional resonance.

(The terms relevance resonance, intellectual resonance and experiential resonance, are taken from the work of Maruyama (1961b, 1969). However, the meanings assigned in this study vary slightly from those assigned in the original context.)

A SYSTEMS VIEW OF THE PROBLEM*

From the perspective of systems theory the study may be viewed as an attempt to discover whether a given instructional system exhibits the characteristics of a centralized system. A centralized system is one in which a single element, normally referred to as the leading part, plays a major or dominant role in the operation of the system (Hall and Fagen, 1956, p. 22). In the present

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*Since it is a perspective which pervades the study, the relevance of systems theory for curriculum research is discussed at length in Chapter 2.

study it was hypothesized that the system abstracted would function as a centralized system, centering on a leading part called the knowledge code.

The properties of an instructional system, or any system, at a point in time may be referred to as the "systemic state property," which is described by Laszlo (1972) as a "coactive relation of parts resulting in ordered wholeness in the state of the system [p. 36]." If the knowledge code is indeed the leading part in the system the function of adaptation will result in a reorganization of the system's state with a new and different elemental configuration (systemic properties exhibited). If the knowledge code is not the system's leading part, the function of adaptation will result in a re-establishment of the previous steady state and there will be no change in the elemental configuration, except for the change in the knowledge code.

THE RESEARCH DESIGN

The hypothesis formulated to provide direction for the study was that there exists a relationship between the knowledge code employed in an instructional situation and the systemic properties displayed by the situation (i.e., instructional systemics).

With specific reference to the instructional system abstracted, it was hypothesized that there exists

a relationship between the knowledge code employed in an instructional situation and the relative emphasis given to:

(i) knowing how and knowing that

(ii) "knowing that" in the weak sense and "knowing that" in the strong sense

(iii) evaluative inquiry and non-evaluative inquiry

(iv) teacher-centered activity and group-regulated activity.

It was further hypothesized that

(v) the degree of instructional resonance displayed would be directly related to the knowledge code employed.

In order to test the hypotheses, a series of five naturalistic, quantitative case studies (Snow, 1974, p. 288) was conducted. Each case was composed of one classroom situation in which a collection code was observed to prevail and one classroom situation in which an integrated code was observed to prevail. The five cases were selected through processes of judgmental sampling. Both situations in each case were taught by the same teacher in an attempt to control variables which might influence the nature of the transactions. The same degree of control was not possible as far as student participation in both situations was concerned. Student overlap, i.e., the number of students participating in

the two situations, varied from a low of zero in one case to a high of more than fifty percent in another.

In each case study data pertaining to the instructional systemics of the two situations were collected, primarily through systematic classroom observation, by a team of five trained observers. The observers employed the System for Analyzing Classroom Transactions (SACT) and each class was observed for approximately 400 minutes (5 eighty-minute class periods). The data, which took the form of frequency counts, were compared between the two situations in each case study using chi-square analysis, and invariances among cases were mapped.

The System for Analyzing Classroom Transactions (Appendix A), a multi-dimensional classroom observation category system, was developed for the study. It is a system which provides for the description of the behavioral interaction of teachers and students in an instructional situation in terms of four of the variables examined in the study, namely, (i) instructional intent, (ii) conditions of "knowing that," (iii) the form of inquiry, and (iv) the paradigm of activity. The other element of the system, instructional resonance, was not readily amenable to the method of direct observation, and was measured using an Instructional Resonance Inventory (Appendix B), also developed for the study.

ORGANIZATION OF THE REMAINDER OF THE REPORT

Since the idea of system and a systems perspective pervades the research, the relevance of systems theory for curriculum research is discussed at length in Chapter 2. Literature relating to and emphasizing the significance of the elements of the abstracted instructional system is discussed in Chapter 3, Part I. Problems relating to classroom observational research are discussed in Chapter 3, Part II. Chapter 4 is given to a description of the research procedures employed in the study. The findings are reported and discussed in Chapter 5. A summary of the study, conclusions, and suggestions for further research are contained in the sixth and final chapter.

Chapter 2

A SYSTEMS VIEW OF CURRICULUM

The concepts of system and of systemness have served to guide the study throughout. Because of the importance of the systems view to the study, this chapter will be devoted to an explication of the relevance of systems thought for curriculum research. [1]

THE SYSTEMS PERSPECTIVE AND EDUCATION

The idea of a systems perspective is not unfamiliar to most educators, indeed it has received considerable attention in recent years. Unfortunately, however, the field of education seems to have borrowed the superficial semantic artifacts of systems language without espousing a necessary and concomitant systems philosophy. Concepts of input, output and feedback, etc., have become common in much educational discourse, frequently coming to educational scholars by way of administrative procedures

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[1] The researcher's views on the relevance of the systems perspective for curriculum research were originally formulated in a paper entitled "General system theory as a perspective for curriculum research" presented at the meeting of the Canadian Society for the Study of Education, Toronto, June 1974. The paper will appear with the title "Systems thought and curriculum research" in Short, E. C., and Marconnit, G. D. (Eds.), Contemporary thought on public school curriculum (2nd ed). Dubuque, Iowa: Wm. C. Brown (in press).

such as the planning-programming-budgeting system (PPBS) and the program evaluation and review technique (PERT). Such 'systems,' however, are expressions of a line of thought based in weapons technology and industry, with the result that a mechanistic school-as-a-factory metaphor has come to dominate much thought related to education. On the other hand, the dynamic notion of systemness, stemming from Ludwig von Bertalanffy and the systems movement associated with him, has been comparatively neglected by educators. There has been a tendency to think of systems solely in terms of a management technique, and the systems view of the world as a valuable heuristic for the greater illumination of those phenomena with which educators are vitally concerned has received scant attention.

A View of Systems

The notion of a system is a pervasive one. It can be found in fields as diverse as engineering and philosophy, and mathematics and ecology. Consequently it has been variously defined. It may be viewed as "any arbitrarily selected set of variables [Ashby, 1960, p. 25]," or as "a mutually interacting complex of processes, characterized by many paths of cause-effect interactions [Watt, 1966, p. 2]," or as "an assembly of elementary parts [Gosling, 1962, p. 1]." Bertalanffy

(1968) has defined a system as a "complex of elements standing in interaction [p. 33]," and Ackoff (1963) as "a complex of interrelated entities [p. 121]." The common kernel which may be derived from the various definitions is that any system is an organized complexity of mutually interacting elements. Consequently its description involves not only a delineation of its components but also of the interactions obtaining among them. In addition it might be emphasized that any man-made system also displays the attribute of "purpose," i.e., a man-made system is goal seeking; it is concerned with achieving an end. Curriculum related systems, therefore, might usefully be regarded as sets of elements united by a pattern of mutual interaction in order to achieve certain purposes.

It is perhaps more valuable to refer to <u>curriculum related systems</u> rather than to a "curriculum system." Hopefully this will negate any tendency to think of curriculum in terms of a single, coherent, monolithic structure, rather than in terms of a diverse range of phenomena which for convenience we frequently place under this collective rubric. Curriculum, according to the concept of it which we might stipulate, may be viewed as a system in and of itself, or as the output of a system, or as input into a system. Curriculum, or curricular phenomena, in this way, may be viewed as being associated with a variety of substantively different systems. They

are, nevertheless, curriculum related systems, and the remarks contained here may be directed toward any of them.

The Appeal of the Systems Perspective

The appeal of systems thought to a wide variety of fields may be traced to its anti-reductionist orientation, and to its inter-disciplinary capacity. The scientific world view against which the systems view of the world rebels is one of unidirectional causal flow, a view which rendered the goal of science solely analytical, i.e., "the splitting up of reality into every smaller units and the isolation of individual causal trains [Bertalanffy, 1968, p. 45]." Expressions against such a world view have been manifested not only in a recently emerging systems orientation. Such notions as holistic, field, gestalt, wholeness, have also appeared in many areas of scientific endeavour including the social as well as the natural sciences. All of these endeavours, however, insist that we think of the world in terms of systems of elements in mutual interaction. The underlying ontology is one which demands a dynamic conception of existence with elements exhibiting a mutually causal relationship.

The interdisciplinary capacity of systems thought is to be found in the fact that its concepts are content empty and context free, i.e., they are meta-level concepts which may be applied in a variety of substantive areas. The developing discipline of general system theory is

providing an ever increasing body of knowledge demonstrating the universality of systems properties, and scholars in a variety of special domains are finding it possible to usefully exchange their systems findings, as is demonstrated by the work of the Society for General Systems Research.

THE PROBLEM OF CURRICULUM

In curriculum we have long been aware of the complex nature of the phenomena we confront, and the need to pay considerable attention to the overall state of the system as well as to the properties of the constituent elements. However, we have been lacking powerful conceptual schemes. "Nowhere in education," said John Goodlad (1958) some time ago, "is there greater need for a conceptual system to guide decision-making than the field of curriculum [p. 391]." More than a decade later he was forced to repeat the same point (1969, p. 369). Indeed throughout curriculum related literature, since John Dewey's observations on the sources of a science of education in 1929, there have been persistent pleas for more adequate conceptual systems and improved theory. While a systems orientation does not, and indeed cannot, provide curriculum with a ready-made set of conceptual structures for the interpretation of particular observations (it is up to the experts in the field to perform

that task), it can provide a broad paradigmatic framework within which curriculum scholars may view their own special domain.

Decker Walker (1973) has recently claimed that the central problem of curriculum is "What should be taught, studied and learned?" While the question is assuredly an important one, some doubt may be cast upon the view that it is "the" central question in curriculum, if indeed there is one. Furthermore, it is a problem which may be no more central to the work of curriculists than to others who might claim the distinction of being educators, whether philosopher, administrator or classroom teacher. Rather Walker's question might be viewed as one of three important questions which collectively encompass the special domain of curriculum inquiry. One is the question of what is presently being taught, studied and learned. A second is Walker's question of what should be taught, studied and learned. And a third is the question of what action should be taken in order to eliminate any variance between the "is" and the "ought." Implicit in all of these questions, though perhaps not central, are questions of why, how, to and by whom, and when. The curriculum scholar then, since he is concerned with both "what is" and "what should be," must of necessity function as an applied scientist at the interface of the descriptive and the normative, seeking to accommodate the

former to the latter.

Essentially the curriculum scholar is faced with two tasks, both of which involve model building. In the first instance he is involved in the construction of a model which defines "what is," i.e., defining the problem, and in the second instance he is involved in constructing a model of "what should be," i.e., defining the solution. The former is a description of an existing social phenomenon, the latter is a prescriptive fabrication. Both are essential if not always equally evident aspects of work in curriculum.

A perusal of curriculum literature leaves little doubt that the appraisive question, i.e., what should be taught etc., has been widely considered. On the other hand, there is an apparent dearth of descriptive studies. Indeed it would appear that we know little about two fundamental questions: (i) how does the curriculum come to be shaped as it is? and (ii) whom and what does it affect and how (Goodlad, 1969)? It is this imbalance between the normative and the descriptive in curriculum discourse which has prompted the comment that "educational researchers have traditionally been more concerned with improving education than with understanding it [Johnson, 1967, p. 127]." The implication is not that the curriculum scholar should assume the guise of an Epicurean dilletante studying the phenomenon for its own sake. Certainly

curriculists must be concerned with improving education, but it must be understood that the way to improvement lies in the better understanding of the "what is" of curriculum related systems. In order to ultimately alter the properties and control the behaviour of curricular phenomena we must first approach them with the intention of discovering "what is" and "what can be." In this respect the normative and the descriptive are inextricably enjoined.

Systems Analysis

The problem of describing the existing situation in curriculum related systems (i.e., defining the problem) is essentially one of systems analysis, whereas the task of prescribing a preferred alternative (i.e., constructing a solution) is one of systems synthesis and design. Collectively the tasks may be characterized as involving (a) a definition of the present state of the system, (b) a determination of the system's needs, and (c) the design of a new or modified system which will fulfill those needs. On a more particular level the tasks of analysis and design may be viewed as being composed of a number of subservient activities.[2]

One way to approach the problem of analysis is in

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[2]Several aspects of the processes of analysis and design described here draw heavily on Sutherland (1973).

terms of four sub-tasks. In the first instance there must be a concern with the identification of all those major variables (systemic elements) which are likely to have a significant influence in shaping the "state" of the system at any given time. At this point the focus is on the identification of the major or leading parts of the system, since it is these which exert a dominating influence over the system's state. The realization, however, that systemic elements exist in a mutually causal relationship must not lead to the erroneous assumption that they are therefore equally causal. Any element in a system will affect all other elements in the system in proportion to its systemic importance relative to the others.

A second task necessitates the focusing of attention on those lower order factors which help shape and determine the properties of the system's leading parts. Where possible these factors must be identified and their influence upon the major components ascertained.

Third, there must be a concern for describing the nature of the relationships obtaining between and among the major elements identified as composing the system. It may be asked how it is that the elements are related so as to "cause" the observed state of the system. What is the nature of its elemental hierarchy? Which elements "dominate" the system at the expense of others?

Fourth, and an essential aspect of analysis as

it pertains to curricular problems is the task of ascertaining which elements in the system are presently amenable to manipulation and control by the systems designers, and which, for the time being at least, lie beyond the capacity of systems designers to control. The former are referred to as constitutive elements, and the latter as situational elements; they are the Aristotelian notions of the practical and the theoretical recently employed by Schwab (1972). It is very often a successful conclusion to the task of determining what is constitutive and what is situational which will have an important effect upon processes of system design, ensuring that designers operate in the realm of the possible.

Systems Design

The identification of the system's leading parts and their "causes," a delineation of the relationships obtaining among them, and a determination of whether the elements are constitutive or situational, collectively represent a definition of the problem. The prescriptive fabrication which emerges from a process of system design constitutes an idealized representation of a solution. While both analysis and design may employ a systems perspective it must be emphasized that the empirical data derived in the process of analysis can only tell what is the case, it cannot tell whether it is desirable.

As with the process of analysis, the process of design may be viewed in terms of a number of subservient activities. An initial task in design is that of determining which "problem" components are most in need of change, whether in terms of modification or elimination, or in their structural or processual properties. A second task is the construction of a new configural pattern of elements and relationships which will lead to improvement without any dysfunctional degree of intra-systemic conflict, interference or redundancy. Thirdly, the structural and processual changes introduced with the new system must be evaluated: basically the a priori predictions and the observed outcomes must be examined in order to determine if there has indeed been movement away from the problem situation in a desirable direction, and to determine the degree of divergence between the predicted and the actual.

Theoretically there are two ways in which the tasks of design as described above might be operationalized. One is to proceed from a secure theoretical basis which allows accurate prediction of the results of action taken. Unfortunately, such a body of theory in curriculum is presently lacking. The other method is simply that of trial and error, trying not to repeat the same mistakes twice. James S. Coleman (1972) has clearly illustrated the point with an example from physical

science. Consider, he says:

> the estimation of the trajectory of a cannon ball after development of the Newtonian theory of motion. There are two ways to estimate the trajectory. One is to use Newtonian theory and calculate the expected trajectory based on the known exit velocity of the cannon ball, a calculation of the distance to the target, and the known gravitational constant. The second is to shoot the cannon, see where the ball lands, and adjust the aim to compensate for the deviation. The first is an elegant method, but likely to be very wrong. Only when the theory was made far more sophisticated through knowledge of the effect of air resistance, wind effects, effects of the shape of the projectile, and other factors, and only when calculations came to be instantly achievable did the elegant method become useful [p. 4].

He goes on to point out that even today artillery units enploy "forward observers" who report back on the accuracy of the shot, and indicate what type of adjustment is required. It would appear that, at the present time, we in curriculum can hope for little more than to make our best guess on the basis of our current state of knowledge, gradually compensating for variance on the basis of information provided by our own "forward observers."

A TYPOLOGY OF SYSTEMS

The image of analysis and design presented above represents a generalized problem-solving paradigm. As a paradigm it is an idealized representation of a set of procedures which might be used in a variety of situations. However, the difficulty which will be experienced will be directly related to some of the properties of the system being investigated. Consider, for example, Sutherland's

typology of systems. Given an initial set of starting-state conditions, he points out, a deterministic system is one where there is one and only one event which may be assigned a significant probability of occurrence; a moderately stochastic system is one where a limited number of qualitatively similar events must be assigned significant probabilities of occurrence; a severely stochastic system is one where a large number of qualitatively different events must be assigned significant probabilities of occurrence; and an indeterminate system is one where there is no event which can be assigned a significant probability of occurrence—thus the high probability that some outcome we have not been able to pre-specify will occur (p. 65).

Given such a characterization of the nature of systems, workers in the area of curriculum are inevitably faced with the task of ascertaining into which category or categories curriculum related systems fall. The behavioral objectives movement which insists on the formulation of "specific learning objectives, clearly stating whatever the learner is expected to be able to do, know and feel as an outcome of his learning experience [Banathy, 1968, p. 22]," would seem to be assuming a deterministic type of system. On the other hand, those educational movements which deny the value of pre-planning and pre-specification of experiences, and emphasize the

intrinsic as well as the instrumental value of classroom experiences would appear to be refusing to recognize any measure of regularity and lawfulness, and thereby would appear to be viewing the system as indeterminate. Another view would seem to be that curricular related systems are neither one nor the other per se. The category into which any system might fall must be recognized as being in large measure determined by the amount of knowledge which is possessed about that system. The more that is known about the system's elements and how they interact, the less likely it is that that system will be viewed as indeterminate. That is not to say, however, that there are not certain properties inherent in any system which help determine its location along the deterministic-indeterminate continuum; only that systems may appear indeterminate when little is known about them, and become less indeterminate as knowledge about them increases. Ultimately, it might be argued, knowledge of the system should reach that point where its performance is perfectly predictable—although this would necessitate a morphostatic rather than a morphogenic system. Nevertheless, complete knowledge about a system represents an ideal, movement toward which constitutes progress, even though the ideal itself may be unattainable. At present, however, the state of knowledge in the curriculum field might tend to suggest that we have reached that point where the system

must be viewed as lying somewhere in the stochastic range.

The allocation of curricular phenomena to the stochastic range appears to be justifiable on two counts. In the first place, the array of variables which we presently employ in curriculum research is undoubtedly incomplete. Indeed the openness of curriculum related systems might tend to suggest that it may not be possible to identify all those variables which impinge on the functioning of the system. At the same time we have to recognize that the behavior of some of the systemic elements in the field of curriculum may only be accounted for probabilistically. Of particular relevance in this respect is the behavioral complexity of the human elements in the system. Given that we are dealing with incomplete information, and that the behavior of certain elements in the system is not perfectly predictable, it would appear essential that we approach questions of curriculum in a probabilistic rather than in a deterministic fashion. The displays we construct and the preparations we make, therefore, cannot signify anything more than a possibility; they possess a potential which is dependent upon the human elements in the system for life and meaning.

The implication of such a viewpoint, of course, is that since analysis of the system cannot result in a "total" definition of its properties and of its behavior, then attempts at systems design must proceed along the

lines of a "best guess." Essentially, "we must proceed heuristically, implementing system parts, constantly testing their relative effectiveness and efficiency, modifying where indicated, and rapidly changing . . . for yesterday's optimal system design is sure to be tomorrow's atavism [Sutherland, 1973, p. 67]." Unfortunately, our "best guess" has not proved very acceptable in recent years, within the confines of our domain or beyond, and expressions of dissatisfaction are likely to persist for as long as it is erringly insisted that non-deterministic curriculum related systems be treated as though they are deterministic.

If indeed it can be accepted that curricular phenomena frequently exhibit characteristics typical of stochastic systems, i.e., if from a given set of starting-state conditions a wide variety of outcomes is possible, then it might prove valuable to break with the input-output notion of systems and begin to explore some additional concepts which have been empirically exemplified in a number of diverse fields. Certainly a systems orientation will provide a perspective for linking the descriptive and the normative, it permits a probabilistic rather than deterministic approach to understanding curricular relationships and, perhaps above all, prevents a simplistic interpretation of a complex phenomenon.

Chapter 3

REVIEW OF RELATED LITERATURE

The review of related literature reported in this chapter falls into two major parts. Part one is concerned with a consideration of the substantive aspects of the study, and part two focuses upon a consideration of the procedural aspects of the study.

PART ONE: SUBSTANTIVE

A comprehensive search of the literature has confirmed Rice's (1973) claim that there is no empirical evidence to support any one manner of organizing knowledge for instruction over any other. Nowhere in the literature was there found evidence of an empirical type which might associate the characteristics of any learning situation, i.e., the instructional systemics, with any particular type of knowledge organization. The study, therefore, has been conducted within the framework of an abstracted instructional system, the elements of which have been identified as constituting significant dimensions of the process of instruction, particularly in the realm of social studies education.

Instructional Intent

There can be no question but that schools are in the knowledge business. Their task is that of having their students acquire as much knowledge as possible. It is this acquisition of knowledge which composes their "instructional intent."

Frequently, however, it would seem that the process of education as observed in most schools functions according to a rather constrained conception of what it is that constitutes knowledge. Often the definition to be inferred from their operations is one of "a rhetoric of conclusions [Schwab, 1960, p. 185]" to be transferred to the student. It is an emphasis identified by Silberman (1970) in many public school classrooms in the United States, and one observed by Schwab (1969) at the undergraduate level. It is a conception which emphasizes the acquisition of a "compendium of information [Parker and Rubin, 1966, p. 1]" and tends to neglect or simply ignore or not give explicit consideration to those cognitive processes which emphasize the creation, utilization and communication of knowledge. It is this distinction between knowing how to do something and knowing that something is the case, a distinction drawn by Ryle (1949) in the realm of philosophic analysis which is referred to popularly as the 'process-content' dichotomy.

This dichotomy has been the focus of considerable

educational discourse in the period since the end of the Second World War. Certainly the idea of 'process' occupied a position of prime importance in the Deweyian learning by doing conception of classroom transactions. However, the essentialist reactions of the late forties and fifties moved away from an explicit consideration of process, asserting that teaching the known culture is sufficient since process outcomes will be an inevitable concomitant (e.g. Bestor, 1953, 1955; Rickover, 1959, 1962). By the early sixties, in the wake of the Soviet successes in outer-space, a number of curriculum projects had emerged which placed considerable emphasis upon 'process' as well as 'content.' Among these were PSSC Physics, BSCS, Chem Study, and SMSG Math. Of these projects it has been pointed out that if any one quality could characterize them in their diversity, it would be their attention to process (Goodlad, von Stoephasius, and Klein, 1966). More recently Rogerian disciples have emphasized the need for <u>learners</u> rather than <u>learneds</u>, i.e., "people who are able to solve problems, make decisions, and find answers, not merely people who are full of information [Hunkins, 1972, p. 5]," and proponents of autotelic learning techniques are emphasizing 'content' as the vehicle for 'process' education (Stadslev, 1974, p. 4).

The distinction drawn by Ryle between <u>knowing that</u>

and knowing how implies a logical difference between the possession of information and the possession of skills, respectively (Soltis, 1968, p. 29). From time to time, however, the utility of the distinction has been challenged. Hartland-Swann (1956), for example, has argued that all knowledge is essentially knowing how or performative in nature. On the other hand, attempts have been made to assimilate knowing how to knowing that (Soltis, p. 47). However, the distinction possesses a particular heuristic value within the context of the present study.

Essentially the heuristic value of the distinction lies in its capacity to facilitate the description of the instructional intent in any classroom situation. Instructional intent of the knowing how variety refers to the situation where the intended learning outcome is the acquisition of a skill, whereas instructional intent of the knowing that variety refers to the situation where the intended learning outcome is the acquisition of information, whether in the form of fact, concept or generalization.

It has frequently been claimed that educators have too often regarded knowing that as the basic type of knowing and have consequently accorded it too much attention (Soltis, 1968, p. 47; Holloway, 1975, pp. 4-8). Gallagher's (1967) research, associated with the BSCS curriculum, lends some measure of empirical support to

the assertion. In a study of instructional processes in six classes observed during three consecutive days he found that 86 percent of all "topics" had the acquisition of information, i.e., knowing that, as their instructional goal. In two of the classrooms there was not a single instance of a "topic" which had the acquisition of skills, i.e., knowing how, as the instructional goal.

The apparent emphasis given knowing that in most classrooms is one which has attracted the attention of proponents of the integrated approach to organizing knowledge for instruction, and it has been asserted that an integrated educational knowledge code will promote "inquiry and discovery [knowing how], instead of . . . rote memory and regurgitation [knowing that] [Keller, 1968, p. 20]." The imputation of rote memory and regurgitation to knowing that is unquestionably a narrow one. This is particularly evident when it is acknowledged that knowing that may not simply involve claiming that certain propositions are true (Roland, 1959), but may also refer to a discursive or theoretical elaboration of a proposition. Sing-Nan Fen (1966) has illustrated the point by emphasizing that:

> . . . the 'man in the know' is not the man who can simply say that such and such is false and so and so is true. He is rather the one who can theorize or elaborate on what he is saying systematically [p. 164].

Clearly, knowing that in this latter sense presumes

knowing how to do certain other things. Nevertheless, the distinction between knowing how and knowing that in this study refers solely to the difference between the intention of promoting the acquisition of skills and the intention of promoting the acquisition of information. The various dimensions of knowing that alluded to by Roland and Sing-Nan Fen receive consideration as "conditions of knowing that."

Conditions of "Knowing That"

As Roland (1959) and Sing-Nan Fen (1966) have asserted, to claim to know that something is the case may not simply be a question of stating that "such and such is false and so and so is true." Nevertheless, many of the knowledge claims that are made, particularly in social studies classes, do appear to adhere to this limited conception (Massialas and Sprague, 1974). A knowledge claim of this type has been termed knowing that in the weak sense, and is to be contrasted with knowing that in the strong sense (Hintikka, 1962, pp. 18-19) in which case the person claiming to have knowledge must go beyond the initial assertion of what is the case, providing justification for the assertion.

The distinction between knowing that in the weak sense and knowing that in the strong sense is one employed by Scheffler (1965) who points out that "in the weak sense,

knowing that depends solely in having true belief; in the strong sense it requires something further—for example, the ability to back up the belief in a relevant manner, to bring evidence in its support [p. 9]." The conditions of knowing that in the two senses are clearly different. In the weak sense there is only the condition of belief; in the strong sense, in addition to the condition of belief, there is the condition of evidence, providing what Ayer (1956) calls "the right to be sure [pp. 31-35]." Knowing that in the strong sense, therefore, is a condition of "warranted belief [Conklin, 1967, p. 229]." Conversely, knowing that in the weak sense may represent a condition of unwarranted belief.

The concepts of knowing that in its weak and strong senses have recently been approximated in a study reported by Massialas, Sprague and Furst (1975, pp. 169-208). The names employed in this study were "opining" and "inquiry" respectively. Opining was the term used to refer to the "style" of interaction in those classrooms where a considerable time was spent "presenting hypotheses or positions but that did not devote much time to probing their positions . . . [p. 177]." On the other hand, 'inquiry' was the term used to describe classes that "spent a major portion of their time presenting, clarifying and supporting hypotheses, positions, or opinions [p. 177]." Of the sixteen classrooms investigated in

the study, five were identified as emphasizing an "opining" style of interaction, and six were identified as emphasizing an "inquiry" style. The study was purely descriptive in nature, and no attempt was made to relate the "style" of classroom interaction to any independent variable or leading part.

Clearly the value judgment implicit in any consideration of knowing that in its strong and weak senses is that, in the educational context, knowing that in the strong sense is to be preferred to knowing that in the weak sense. Scheffler (1965) has suggested that "those educators who stress the so-called discovery and problem-solving methods in schooling may, in fact, be operating upon the assumption that such methods lead to strong knowing as an outcome [p. 10]." Discovery and problem-solving methods have been claimed as necessary dimensions of "integrated" curricula (Chappell, 1970, p. 39; Houston and Burke, 1973, pp. 70-71; Keller, 1968, p. 20), although proponents of "collection" curricula have been equally insistent that discovery and problem solving are also essential characteristics of their orientation (Bruner, 1961).

The Forms of Inquiry

The importance of knowing as an objective in the educative process has been emphasized with respect to the

instructional intent and the conditions of "knowing that." It is not a notion, however, which may be usefully employed to describe the day to day activities of teachers and students. Knowing can be viewed as an objective which may serve to guide activities, and when attained it is an achievement fulfilling certain conditions; it is not a kind of mental operation or activity (Ryle, 1949, p. 16 ff.). Day to day instructional activities may be more usefully interpreted in terms of the conscious effort to gain knowledge, that is, in terms of the process of inquiry. That is not to say that all knowledge is the result of deliberate inquiry. Clearly much of what we know we have not deliberately set ourselves to find out (Scheffler, 1965, p. 32), but schooling is a purposive activity in large measure concerned with the attainment of knowledge, and in this context inquiring may be seen to be the "subservient task activity" to knowing.

Charles Morris (1964) in his work on semiotic has suggested that there are three main types of problem to which inquiry may be directed: (1) problems of what has happened, is happening, or will happen, (2) problems of what to do, (3) problems of what to accord preferential behavior. Morris further points out that inquiry will terminate in three different kinds of assertion with respect to these three different kinds of problems. Inquiry into what has happened, is happening or will happen

terminates with designative statements and is referred to as designative inquiry. Inquiry into what to do terminates with prescriptive statements and is referred to as prescriptive inquiry. Inquiry into what to prefer terminates with appraisive statements and is referred to as appraisive inquiry (Morris, 1964, p. 26). While conceptually distinct, the forms of inquiry are not separate, and while engaged in any one of them "one uses the other forms of inquiry at various stages of the process [Morris, p. 28]." The forms of inquiry, therefore, may be regarded as phases of, and emphases within, a more general process of inquiry, considered here as a reflective process involving a transaction between a display and an inquirer, and directed toward solving a problem. (The notion of "display" employed here is derived from Dewey (1949), Jackson (1966), Johnson (1968) and Aoki (1970), and is used to refer to the selected segments of the environment given symbolic representation in the educational knowledge codes.) It is this transaction between student and display which is crucial in the instructional situation. The recent emphasis upon interpersonal and social interaction in classroom research is one which

> . . . serves to obscure the fact that the fundamental interaction in instruction is not among people, but between an individual and selected elements of his environment. In this transaction . . . the instructor or program author is not a participant, but a mediator, and often, a meddler. He is a stage manager and a

director, but not an actor [Johnson, 1968, p. 10].

While a distinction may be drawn between prescriptive and appraisive inquiry, it is also possible to regard them as collectively constituting evaluative inquiry as opposed to designative inquiry which is non-evaluative. It is this latter distinction, i.e., between valuative and non-evaluative inquiry which was drawn upon extensively in the study. Again it should be recognized that these distinctions are emphases within a more general process of inquiry. In evaluative inquiry, the inquirer is concerned with deciding upon a preferential course of behavior, with identifying the objects and actions which will receive preferential consideration. In order to make his decisions he will be dependent upon accurate information which can only be acquired through designative inquiry. In this way, non-evaluative or designative inquiry can be viewed as a phase, albeit a prerequisite phase, in the process of evaluative inquiry.

Evaluative inquiry has always been recognized as an implicit element in the educative process. Recently, however, there have been increasing demands for its explicit consideration, particularly within the realm of social studies education (for example, Casteel and Stahl, 1975; Fraenkel, 1973; Kohlberg, 1963; Raths et al., 1966; Read and Simon, 1975). At the same time, it has been implied that the capacity which an instructional system

may exhibit for promoting one form of inquiry as opposed to the other may be constrained by the knowledge code employed. For example, the integrated approach which is frequently associated with evaluative inquiry is often regarded as "soft pedagogy [Levit, 1971, p. 174]," draining the intellectual content from knowledge as a means of superficially stimulating student enthusiasm (Wise, p. 395). On the other hand, the separation of questions of fact and questions of value, the result of a vigorous application of Ockham's razor in the design of social science curricula for Canadian schools where the pervasive tradition of discrete disciplines continues to persist (Finn, 1971), has been called into question. For example, Joseph Katz (1974) has asserted that "the public schools of Canada have become cultural deserts, places where children and youth are sacrificed on altars of barren facts called curricula devoid of the values which give them meaning [p. 47]." Implicit in Katz's remarks is a concern for an orientation that will go beyond the "descriptive ethics" of sociologists and anthropologists to a consideration of "normative or substantive ethics" (Walker, B., 1971). The widespread concern for attention to normative ethics in the process of schooling is evidenced in the evolution of social studies curricula in Alberta, and is reflected by Bruner (1971) when he wrote that:

> I believe I would be quite satisfied to declare, if not a moratorium, then something of a de-emphasis on matters that have to do with the structure of history, the structure of physics, the nature of mathematical consistency, and deal with it rather in the context of problems that face us [p. 21].

In most respects, the tradition of western science, at least since the seventeenth century, has attempted to assume a value-neutral stance, asking only questions which are "designative" in their major characteristics. In a tradition of schooling which has employed the "disciplines" as the major 'units' of knowledge from which curricula are derived, it might be expected that the disciplines would exert a significant influence upon the nature of school curricula. Briefly, the point of view might be summarized as follows: for man, the scholarly disciplines of knowledge represent the cumulative wisdom of countless generations of cultural evolution; it is they which have identified what are significant problems; in order to investigate the problems they have provided a set of structures, substantive and syntactical; therefore, the essential task of schooling is initiation into tried and tested ways of thinking about pre-specified problems.

In a tradition of science which has tended away from questions of a valuative nature, it might be expected that the tendency would be reflected in any curriculum based upon such a tradition. On the other hand, it might be expected that a curriculum based upon an educational

knowledge code, which is in some measure liberated from traditional conceptions of knowledge organization, might espouse a more encompassing conception of what it is that constitutes a legitimate question in the process of schooling, thereby encorporating the evaluative and the non-evaluative dimensions of the process of inquiry.

The Paradigm of Activity

It has been noted in the previous section that the fundamental interaction in the process of instruction may be viewed as taking place not among people but among individuals and the "display." However, it was further noted that the instructional transaction is mediated by the 'instructor' who may be personally present or absent from the instructional situation, i.e., he may be a teacher actively engaged in instructing children in a classroom situation, or he may be the 'author' of materials employed by students in the process of inquiry. In both cases, the instructor, with the student, builds a relationship through which the transaction is mediated. It is the character of this relationship which is considered under the heading of "paradigm of activity."

The notion of "paradigm" in current usage has a multiplicity of meanings ranging from "the entire constellation of beliefs, values, techniques, and so on shared by the members of a given community [Kuhn, 1969, p. 175],"

to a simple exemplar or model (Rosenshine and Furst, 1973, p. 122; Kaplan, 1964, p. 118; Kuhn, 1969, p. 175), usually in the sense of "model for." As used here, the idea of a "paradigm" is descriptive rather than prescriptive, and refers to the major characteristics exhibited by a given phenomenon, the phenomenon in this case being the relationship through which the classroom transaction is mediated. In the restricted sense of the study, a paradigm of activity was considered to be that dominant pattern of interaction, or way of proceeding, which is reflected in the authority relationships existing between the display and/or teacher, and the student.

The importance of authority relationships, particularly that existing between teacher and taught, have been emphasized in attempts to describe how classrooms operate (Dreeben, 1972, pp. 457-463). The relationship has been variously characterized along continua, from democratic to autocratic, integrative to dominative, student-centered to teacher-centered. However, the tradition of democratic-authoritarian studies, stemming largely from the work of Lewin (1943) and Lippitt and White (1943) has been inconclusive in terms of any measure of classroom effectiveness, especially when the latter has been approached in terms of "productivity." Anderson (1959), for example, has reported that "we cannot state with any certainty that either teacher-centered or learner-centered methods are

associated with greater learning [p. 206]." Of thirty-two studies which he reviewed, eleven reported greater learning for learner-centered groups, thirteen showed no difference, and eight found teacher-centered methods superior. On the other hand, it was a rather general finding throughout the studies that "morale" is higher in learner-centered groups.

An important difficulty associated with the authoritarian-democratic tradition of classroom research has been pointed up recently by Dowality and Schumer (1973). "One source of difficulty with previous studies," they emphasize, "is that they have typically been analyses of main effects [p. 125]," i.e., a comparison of method A versus method B in an attempt to discover a single best method. The possibility of an aptitude x treatment interaction, they point out, has been largely ignored in leadership studies. In their own research they have discovered a disordinal interaction between two modes of classroom instruction and student "manifest anxiety," with a teacher-centered mode of instruction optimizing "productivity" for high-anxious students, and a student-centered mode optimizing "productivity" for low-anxious students. The aptitude x treatment effects hypothesized by Dowality and Schumer point up the need for a further consideration of the teacher-centered/student-centered dichotomy. The particular relevance of such a dichotomy

in this study lay in the possible existence of a relationship between the knowledge code employed in an instructional situation and the paradigm of activity which might prevail in that situation.

While the tradition of research referred to above has focused upon the idea of a "style of leadership" within a broad context, the conceptions of teacher-regulated and group-regulated classrooms derived from it were of particular value in the present study, permitting a dichotomous consideration of the paradigm of activity. This was particularly important in view of the fact that one dimension of the dichotomy has tended to be associated with an educational knowledge code of the collection variety and the other with an integrated code.

Bernstein (1971) has suggested that there is a relationship between the use of a knowledge code of the collection type and a paradigm of activity which he terms "didactic," and the use of a knowledge code of the integrated type and a paradigm of activity which he refers to as "self or group regulated [p. 61]." With the "didactic" paradigm dominant, students tend to be seen as ignorant, with little status and few rights (Bernstein, p. 58), the paradigm reflecting the "banking concept of education [Freire, 1968, p. 57 ff.]." With the "self or group regulated" paradigm dominant, students tend to be viewed as associates-in-learning with teachers (Keller,

1968, p. 20) and a concept of education as liberation prevails.

That there is such a relationship between the knowledge code used and the paradigm of activity has been frequently asserted. A collection code will, it is claimed, impose artificial barriers to interfere with the natural course of student investigation (Salt, 1969, p. 23), will encourage a pathological view of the student (Bernstein, p. 58), will subject the minds of the student to the authority of the disciplines (Lamm, 1972, p. 127). While on the other hand, "to take an interdisciplinary approach . . . is to emphasize the role of the student in the process of discovery . . . because no single professor or discipline can pose as a final authority [Houston and Burke, 1973, pp. 70-71]." While the assertions have been strong, the evidence supporting them has been weak.

Instructional Resonance

The concept of "instructional resonance" is one developed out of Maruyama's (1961b, 1969) work on the general idea of resonance. It has been employed in the present study to provide for the description of student perceptions of selected dimensions of classroom experience. Essentially the concept must be conceived as a continuum ranging from a pole of optimum resonance to one of optimum

dissonance. A high degree of resonance connotes a relationship between student and teacher and/or display which is symbiotic and mutually beneficial; a high degree of dissonance one which is antibiotic and mutually exploitative.

One way of viewing instructional resonance in any classroom situation is in terms of three sub-concepts, namely relevance resonance, intellectual resonance, and experiential resonance. The notion of relevance resonance is one which refers primarily to a convergence of goals and purposes. In the context of the present study the convergence involves students and/or teachers and displays. Intellectual resonance focuses primarily on the problem of "difficulty." Essentially the degree of intellectual resonance is dependent upon the capacity of the inquirer to assimilate and accommodate the information provided in the display within his previously existing intellectual structures. It is dependent upon the student's capacity to derive new meaning from the display. A low degree of intellectual resonance may result not only when a student is unable to derive any meaning at all from the display, but also when the meaning derived is already "known" by the student. Experiential resonance is resonance dependent upon the capacity of the inquirer to see the importance and significance of the "subject-matter" of the display, and this will be reflected in his interest in and attitude

toward the display and/or teacher. As indicated above the three resonances are collectively taken as providing an indication of the more general notion of instructional resonance.

A recent study by Permut (1974), published after the data for the present study were collected, has provided some empirical clarification of the notion of "relevance" and its association with other concepts employed to describe various aspects of classroom operations. Concerned with the lack of a systematic idea of what relevance is, Permut conducted a factor-analytic study of student responses to a questionnaire dealing with perceptions of selected school experiences. The results showed relevance in its connotative aspects to be associated with notions of "usefulness" and "goodness," but quite distinct from "difficulty" which in the present study is an indicator of intellectual resonance, and from "interest" which is an indicator of experiential resonance.

The potential for resonance in any classroom situation may be viewed as residing in the match existing between the structures of the display and/or teacher and the structures of the inquirer. Clearly any display will tend to emphasize some goals and not others, some level of competence and not others, some "subject-matter" and not others. Indeed, student, teacher, and display may be regarded as exhibiting a hierarchically distributed set

of preferences which may be termed structures of relevance. Where there is little concordance among the structures of relevance, the resonance will be low; where there is a great deal, resonance will be high.

The importance of resonance in the instructional context has been illustrated by Maruyama (1971) who has asserted that

> Individuals who are in resonance can derive mutual gratification and appreciation from their interaction. When there is no resonance, the interaction may cease, become boring, artificial, exploitative, phony or even explosive [p. 12].

The clamor of students for "'relevance,' 'engagement,' and 'participation' [Hunter, 1972, p. v]" has become common. The provision of these qualities is more rare.

As with the other elements in the abstracted system, relevance resonance has been posited as existing in a particular relationship with the type of knowledge code employed. For example, if it is in fact the case that it is the disciplines which pose the problems education must deal with (Schwab, 1962, p. 197), and it is also the disciplines which define the substantive and syntactical structures necessary to inquiry, then it might be argued as with the "paradigm of activity" that under a collection code, control over the process of instruction does not lie with the teachers and students in the classrooms but with the communities of scholars who make up the disciplines, and that lack of control over the process

reduces the potential for resonance in any given situation.

PART TWO: PROCEDURAL

Data for the present study were collected primarily through procedures of systematic classroom observation. Although a recognized research procedure for more than sixty years (Murray, 1970), it is one which is replete with methodological difficulties most of which receive scant attention in the reports of studies employing the procedure. Herbert and Attridge (1975), for example, report that of more than eight hundred studies employing systematic classroom observational research located through the Educational Resources Information Center (ERIC), only seventeen included discussions of significant methodological problems. Nevertheless, Herbert and Attridge emphasize that:

> Observation of subjects in natural or manipulated settings is potentially one of the most useful techniques for collecting data, and instruments for systematic observation probably form the most rapidly growing set of tools becoming available to researchers.

They further point out that:

> Unfortunately the work which has been done to identify and solve the methodological problems of observation is as yet inadequate to ensure accuracy of findings . . . [p. 2].

The purpose of this part of the report is to review the literature related to the methodological problems alluded to above.

The Dimensions of Systematic Classroom Observational Research

Systematic classroom observational research might usefully be viewed as being composed of a set of procedures by means of which, from the total universe of possible classroom transactions, certain subsets are selected and/or provoked, and their attributes recorded and encoded. Essentially the researcher is faced with the task of finding answers to four major questions. First, what is it that is to be observed? Second, under what circumstances might the chosen phenomenon be observed best? Third, how might the observations be organized and classified so as to facilitate analysis? And fourth, do the observations truly reflect the nature of the existential situation, i.e., are they valid? The rest of this chapter is devoted to a discussion of the difficulties associated with each of these questions.

What to Observe

Characteristic of all classroom observational research is a process of selection by means of which the researcher selects out from the total universe of possibilities and focuses upon those aspects of the 'classroom world' which he considers to be conceptually relevant. This process of selection would appear to be an inevitable condition of any research. However, the history of

classroom observational research has clearly demonstrated that what is "conceptually relevant" for one researcher has infrequently been so for another, with the result that Rosenshine and Furst (1973) have characterized the field as "chaotic, unorganized and self-serving." A less impassioned and perhaps more valuable characterization has been provided by Neujahr (1972) who suggests that the field displays the characteristics of a pre-paradigm science in the Kuhnian sense. Certainly at the present time there is no Newtonian mechanics or Copernican astronomy within which all observations made in classrooms may be located and interpreted. Nevertheless, the researches currently being conducted into classroom operations are neither random nor arbitrary. Of the growing number of classroom observational systems, the vast majority reflect an interest in either the cognitive or affective dimensions of classroom transactions, or in some combination of both; and a lesser number reflect an interest in what might be termed the general ecology of the classroom.[1]

Affective. Perhaps the best known of all classroom observational systems is that developed by Flanders (1965) in order to help characterize teacher influence in the

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[1]An indication of the relative emphases in the field may be gained from a survey of the instruments in Simon and Boyer's (1967, 1970) anthologies.

classroom along a direct-indirect continuum. His work represents an extension of a tradition of research which focuses upon the socio-emotional climate of the classroom. For example, Anderson (1939) focused upon the "integrative" and "dominative" behavior of teachers; Lewin, Lippitt and White (1943) considered "authoritarian," "laissez-faire" and "democratic" leadership styles; Withall (1949) looked at "teacher-centeredness" and "learner-centeredness." This pattern of research has selected out and focused upon some predominantly affective dimensions of classroom operations. It is a line of research which has been, and is being extended (e.g., Amidon and Flanders, 1967; Amidon and Hough, 1967; Galloway, 1968).

Cognitive. Complementing rather than competing with those systems which focus on the affective dimensions of classroom operations is that group of observational systems which might be labelled cognitive. The use of classroom observational techniques to examine the cognitive dimension of classroom transactions would appear to be a development of the early sixties. A seminal work in the area is that of Smith and Meux (1963) who attempted to describe the logical dimensions of the process of teaching. This they did by drawing heavily on philosophic discourse on the nature of definition, description, explanation and evaluation. Derived from Smith and Meux's work, and also

from Wittgenstein's idea of the language game is Bellack's (1966) work on the Language of the Classroom. One result of Bellack's research was that from his observations he was able to infer a pattern of rules or a protocol which guides the "language game" of student-teacher interactions, and provides an explanation for the predominantly dyadic nature of classroom interactions.

Also treating classroom operations from a cognitive perspective is the work of Taba and Elzey (1964). Drawing their conceptual framework from developmental psychology, their system focuses upon levels of thought hypothesized as developing in a necessary sequence through (i) grouping and labelling, (ii) interpreting informations and making inferences, and (iii) predicting sequences.

Gallagher's (1966) Topic Classification System which has been used in connection with BSCS also employs the idea of levels but in quite a different way from that of Taba and Elzey. Developed from the earlier Gallagher-Aschner (1963) studies which were based on Guilford's model of the structure of the intellect, the purpose of the system is to indicate (a) the level of instructional intent, that is, whether the major concern is for content or for skills, (b) the level of conceptualization, that is, whether data, concepts or generalizations, and (c) the level of style, that is, whether the focus of information processing is in terms of description,

expansion, explanation or evaluation.

Two systems emphasizing the cognitive orientation of particular relevance for social studies educators are the Michigan Social Issues Cognitive Category System devised by Massialas (1969, 1975), and a system developed by Oliver and Shaver (1966) in conjunction with the Harvard Social Studies Project. An interesting aspect of both in light of the present study is their concern for distinguishing between normative and descriptive classroom discourse.

Ecological. A significant feature of many observation systems has been their tendency toward an ever increasing atomization with researches focusing upon smaller and smaller bits of classroom behavior (Murray, 1970). One reaction against this trend has been the development of a branch of classroom observational research which draws heavily upon Roger Barker's (1965) conceptions of an ecological psychology (Walker, R., 1972). Kounin (1970) characterizes the trend as "the study of many coexisting events in real settings [p. 63]." In this way no a priori emphasis is given to either the affective or cognitive dimensions of classroom activity, although either or both may be necessary for analysis.

For the most part, research employing an ecological perspective has been characterized by a quest for conceptual systems which might adequately explain learning

environments. For example, Gump (1969) asks "What are their parts? How do the parts relate to each other? How do they relate to the behavior of the occupants [p. 200]?"

One useful conceptual scheme for classroom ecologists has been the use of the sociological notions of "structure" and "function" to help explain what transpires in the classroom (Biddle and Adams, 1967). In the Biddle and Adams study, the notion of "structure" refers to the form and composition of the group, the communication structure, the role structure, and such things as the physical location of teachers and students. The notion of "function" is employed to refer to the activities which occur and to the content of the transactional relationships.

While they may be lacking in the ecological domain, there is certainly no overall paucity of conceptual schemes through which to view classroom operations. Indeed the proliferation of schemes has caused Neujahr (1972) to assert that "no one satisfactory way has been found for describing what takes place in classrooms [p. 224]," but then why should there be a single focus? The question of what it is that should be observed has been answered differently according to different research interests, and the present lack of a single focus of attention characterizes it no more than any other research.

Under What Circumstances

A frequent assumption associated with classroom observational research is that it must take place in so-called 'naturalistic settings.' Ecologists in particular appear to adopt this stance and suggest that "the observation of intact classroom settings where they occur and in their complex, investigator-free arrays is the optimal investigative path [Gump, 1969, p. 200]." It is a position supported by Kounin (1970) who emphasized the need to conduct research "in a spirit of free inquiry rather than in a spirit of debate to see what hypothesis or theory was to be tested [p. 63]."

In many respects the term "natural" has come to have a value connotation as well as a descriptive denotation attached to it. Frequently it is assumed that what is "natural" is more true and real than that which is supposedly 'unnatural.' In behavioral research, however, naturalness can only be viewed as a function of what the investigator does (Willems, 1969). And, of course, being a function of what the investigator does and therefore variable, it needs to be viewed in a relativistic rather than in an absolute manner. In other words, research in natural settings can exist in varying degrees, all of which relate to the degree of provocation exerted by the researcher. Where he has exerted a considerable degree of influence over the antecedent conditions of the behavior

to be observed, the tendency is toward manipulational-experimental research. Where he has exerted little or no influence it is toward naturalistic research. Naturalistic research is described by Barker (1969), a leading proponent of research in natural settings, as being that situation wherein nature is the inducer and the investigator is only the transducer.

It is perhaps useful to re-emphasize that not all observational studies are directed toward questions of ecology. As pointed out in the previous section, attention is frequently directed toward a much more limited range of phenomena, whether affective or cognitive or some combination of the two, and under such circumstances those aspects of the setting that are not relevant to the problem can be altered with minimal effects upon outcomes (Weick, 1968, p. 368). Unfortunately in most research related to classroom operations it is not always known which aspects of the setting are "not relevant." Always, it would seem, we are dealing with an incomplete array of variables and a range of human behavior which is never perfectly predictable no matter how tightly controlled the experiment. That is not to say, however, that systematic observation of the classroom may not be couched within an experimental framework. Rosenshine and Furst (1973) have cited a number of systematic classroom observation studies which fall within the experimental

and quasi-experimental rubric, and it is clearly a technique which may be used to test and generate hypotheses as well as to describe situations.

Organizing and Classifying Observations

The tasks of organizing and classifying observations in order to create data amenable to analysis is associated with two conceptually distinct processes—behavioral recording and behavior encoding (Weick, 1968). Recording takes place when the raw events of a situation are converted into a permanent record whether in the form of a handwritten log or as an audio and/or video record. Encoding takes place when the record (or it may be the original events) is simplified and reduced to a form suitable for analysis.

Recording. The major difficulty in the making of records of classroom operations concerns the objectivity with which a record can be made, and the completeness which can be achieved. Both of these will be restricted to the extent that observations are inevitably filtered through the particular world view of the observer. Herbert (1967) made reference to the problem when he suggested that "when an observer sets out to describe what the teacher does, what he reports will depend upon the eyes with which he sees and the aspect of teaching at which he looks [p. 1]." Because of these difficulties the specimen

records and ethnomethodological approaches of researchers such as Cusick (1973) have been criticized, as have the intuitive-insightful approaches of Jackson (1968). Quite simply it is argued that this type of record construction is too vulnerable to the fallibilities of human perceivers, to their widespread prejudices and biases (problem of objectivity), and that interaction is too complex and too rapid for a complete record to be made (problem of completeness). Consequently the use of mechanical aids in recording has been advocated and indeed most researchers, including Bellack, Gallagher, Smith and Meux, and Flanders, have availed themselves of sound and/or video recordings. The lens, Kounin argues:

> has no biases, theories, preconceptions, needs or interests. It takes in all that is occurring in its field and makes no distinction between what is boring or interesting, major or minor, important or unimportant, outstanding or ordinary, good or bad. And the videotape records it all without forgetting, exaggerating, theorizing, judging or eliminating [p. 64].

However, there are two points which must be made concerning Kounin's claim. First, any lens must be directed by a human agent and is therefore equally vulnerable to biases, theories etc.. Secondly, even if a complete and true record could be made, the major task of creating meaning out of the multiplicity of sensory perceptions remains. The contribution to be made by electronic aids is in providing for an increased reliability of interpretation by making possible repeated viewings of a situation. With

each repeated viewing, however, the same observer with the same inventory of biases remains to try to make sense of the raw data.

Encoding. As mentioned previously, encoding is that process through which raw data are located and interpreted within a conceptual framework. In some systems, for example Gallagher (1966) or Massialas (1975), the encoding is carried out from a record; in others, such as Flanders (1965), observers encode on the spot. Whether the coding is carried out in situ or from records, the categories of codification have been determined before the observations have been made. Only a few studies (primarily those which are ecological in orientation) approach observation without a well defined conceptual structure from which to view events.

The major problem associated with encoding, whether into a priori categories or not, concerns the degree of inference required on the part of an observer. The greater the degree of inference required, the greater is the difficulty of extrapolating validly from specific classroom events to conceptual categories. Rosenshine and Furst (1973) have distinguished three major approaches to encoding based on the degree of inference required. Demanding the least amount of inference is sign analysis which requires the listing beforehand of "a number of specific acts or incidents of behavior which may or may

not occur during a period of observation. The record will show which of these incidents occurred during a period of observation, and, in some cases, how frequently each occurred [Medley and Mitzel, 1963, pp. 298-299]." Examples of "sign systems" are the Flander's instrument and many of its variants, as well as Medley's instrument OSCAR. Requiring a greater measure of inference are category systems such as Gallagher's Topic Classification System. Frequently events analyzed using category systems are subjected to multiple coding. This simply means that all events are characterized along two or more dimensions. In the TCS, for example, these were "instructional intent," "conceptualization," and "style." For each dimension there are usually a number of significant indicators (which are in themselves low inference signs) which guide observers in their classifications. The third, and that form of encoding demanding the highest degree of observer inference is the rating system. This procedure demands that an observer estimate the "frequency" or "strength" with which certain types of event take place during a specified period (for example, Ryans's (1960) study of teacher characteristics).

While as a fundamental principle it would appear wise to adhere to as low a degree of inference as possible, low inference should not be gained by excluding from consideration those aspects of classroom operations

which are conceptually significant, but which also require high degrees of observer inference.

Validity

A great deal of literature concerned with systematic classroom observation has focused upon the problem of reliability. Very little consideration, however, has been assigned the problem of validity (Rosenshine and Furst, 1973). The most comprehensive consideration of validity in observation systems to date has been provided by Herbert and Attridge (1975) who approach the problem in terms of "content," "construct," "criterion-related" and "face" validities. However, their discussion has remained purely conceptual in nature and the absence of examples has produced some problems of interpretaion, which the discussion which follows will attempt to resolve.

Content validity. Content validation Herbert and Attridge point out is concerned with assessing "the content of the instrument as compared with the total behaviors which comprise the dimension it purports to describe [p. 15]." Using the Flander's instrument as an example the question would be whether the content of the instrument, i.e., the categories into which verbal behavior is classified, provides a representative sample of all the possible behaviors from which a measure of indirect-direct teacher influence in the classroom might be inferred. The

procedure proposed by Herbert and Attridge is the use of "appropriate judges."

Construct validity. "Construct validity refers to the degree to which the theoretical claims and supports of the instrument are substantiated both logically and empirically [p. 15]." Essentially, the question is whether (or to what extent) the scores derived from the instrument may be said to measure a theoretical construct. For example, the Teacher Practices Observation Record (Brown, Mendenhall and Beaver, 1968) purports to measure the degree of consonance existing between a teacher's classroom behavior and John Dewey's philosophy of "experimentalism." In order to do this the researchers developed sixty-two "signs," thirty-one of these reflecting consonance with "experimentalism" and thirty-one reflecting dissonance. Construct validity is present in the instrument to the degree that the thirty-one positive signs are indeed an accurate representation of the construct "experimentalism," and the thirty-one negative signs are not. The approaches to construct validation may be either rational-deductive or empirical-inductive, or some combination of both depending upon how the instrument categories were developed.

Criterion-related validity. This type of validity is concerned with the relationship between measures on the

observation instrument in question and some other variable, traditionally some measure of 'growth,' which is used as a criterion. In many instances criterion-related validity is inappropriate to classroom observation instruments since their concern is for description solely, without consideration being given to prediction. The many studies seeking to correlate "socio-emotional" climate with measures of "productivity" and "morale," for example, have been concerned with establishing a criterion-related validity.

Face validity. This is a validity of 'general impression' referring to the degree to which an instrument "appears to measure or describe what it purports to measure or describe. It is determined through the application of intelligence, intuition and reason of the developer, objective colleagues . . . [Herbert and Attridge, 1975, p. 16]," and Herbert and Attridge go on to say that at the present stage of development in the validation of observation techniques, face validity is a most important characteristic for any instrument to possess. The value of an explicit consideration of face validity in any research might legitimately be called into question since it is difficult to envisage an instrument which had not been subjected to the "intelligence, intuition and reason of the developer."

Reliability. Frequently associated with problems of validity is the issue of reliability in systematic classroom observational research. While it is true that a high degree of reliability will not ensure validity, it would appear that validity is in some degree constrained by the level of reliability which can be achieved and that consequently reliable measures are extremely important.

There would seem to be two major points concerning reliability. One is that reliability is not a property of any instrument in itself, i.e., an instrument may not be viewed as having a high or low reliability. It is a property of the measures obtained through an application of the instrument (Herbert and Attridge, 1975). Second, reliability is not a one-dimensional concept, although traditionally observational research has focused upon a single dimension.

The single dimension which has been treated in most observational studies is inter-observer agreement (Weick, 1968). However, its adequacy as a single measure of reliability has been called into question (Medley and Mitzel, 1963; Westbury, 1967; McGaw, Wardrop and Bunda, 1972). A second major type of reliability that would appear to be called for is intra-observer agreement over occasions (Dunnette, 1966; McGaw et al., 1972). In this case the concern is for the "stability" or "replicability"

of observations over time. In effect, this represents a test-retest reliability for observation instruments. A major conceptual difficulty lies in the fact that whereas traditional test-retest approaches to reliability tend to focus upon "relatively enduring aspects of personality [McGaw et al., p. 14]" or performance, the focus of attention in observation studies is often upon classroom behaviors which might be expected to vary systematically, in which case a low intra-observer reliability over occasions represents a true rather than an error variance.

SUMMARY

The review of literature conducted in this chapter has been directed toward two functions. One, the substantive, has been concerned to demonstrate that the elements of the abstracted instructional system are derived from sound conceptual and empirical bases, and that they constitute valuable objects of study, particularly within the context of social studies education. The other, the procedural, has been concerned to demonstrate that while the study has been conducted largely within the framework of a research methodology which is replete with difficulties, the latter have been examined and have received explicit consideration in every phase of the research.

Chapter 4

METHOD

The study was essentially one of main effects, comparing the instructional systemics of classroom situations employing an educational knowledge code of the collection type with those employing an educational knowledge code of the integrated type.

Design

The research design provided for five separate and independently conducted naturalistic and quantitative case studies. In each of the cases the relationship obtaining between the hypothesized leading element (knowledge organization) of the abstracted system and the other elements was examined, and invariances across case studies were mapped. Where an invariant relationship was observed to exist the research hypothesis pertaining to the relevant systemic element was retained. (The research hypotheses are stated on page 15 of this report.)

The case study approach to research is frequently considered as having two major weaknesses. One is that it "makes it virtually impossible to make use of contrasting situations [Baldridge, 1971, p. 32]," and the other is the problem of "typicality," i.e., whether the

case chosen is representative of other similar organizations. There would always appear to be the danger that any single case will be an "empirical freak," a "dramatic instance."

In the present study considerable efforts were expended to avoid both of these weaknesses. The study was designed to avoid the dangers of a one shot case study by providing for a series of replicated studies. Each case, in itself, was composed of two contrasting "organizations," and data derived from five separate studies provided for comparisons. The problem of "typicality" was at least partially provided for by selecting cases which varied in some of their major attributes, such as teacher qualifications and experience, and school location.

Sample

Each case study was composed of two intact classes, one categorized as employing a collection code and the other categorized as employing an integrated code. The total sample was comprised of ten intact classes selected through processes of judgmental sampling, i.e., classes were selected because they exhibited the attributes relevant to the study.

The task of sampling involved identifying those teachers who were employing an integrated knowledge code

in one classroom situation and a collection knowledge code in another classroom at the same grade level. Involving the same teacher in both situations was an attempt to control variables which might exert an influence on the nature of the instructional systemics within each case study. Similarly an attempt was made to identify cases where the same students would be involved with a single teacher in one class employing a collection code and another employing an integrated code. This attempt to control student variables proved impossible since no such instances were found to exist, and only intact classes could be selected. Of the classes which ultimately composed the sample the degree of overlap in student participation in the two situations ranged from 0 to more than 60 percent.

An initial pool of 14 teachers in 6 school districts was identified. The teachers comprising the initial pool were those involved in teaching both social studies and one of the social science options (geography, psychology or sociology) at the grade eleven level. It was thought that social studies courses might prove to be a source of classes employing integrated codes, and social science courses a source of classes employing collection codes. Eleven of the fourteen teachers comprising the original pool consented to an analysis of their courses being conducted, and five of these were tentatively

identified as employing an integrated knowledge code in their social studies classes and a collection code in their social science classes.

The basis of discrimination between the integrated and collection codes was linked to the concept of "classification" (p. 6) which refers to the strength of boundaries between contents. Boundaries are designated weak when a number of perspectives (psychological, sociological, economic etc.) are brought to bear on a single topic or problem being considered by a class, and thereby constitute an integrated code. Boundaries are designated strong when a problem or topic being considered by a class is viewed from a single perspective (i.e., psychological or sociological or economic etc.) and result in a collection code. It was the concept of "classification" which was employed in identifying classrooms employing integrated and collection codes.

In making the initial selections, the research examined textual material (textbooks, handouts, resource units, assignments and examinations), as well as observing the classrooms in action. However, the tentative nature of the initial identification must be stressed. It was a concern of the researcher at this point in the evolution of the study that teacher behavior with respect to the use of integrated and collection codes might be extremely variable over time (though this proved not to be the case)

and that during the period of data collection classes formerly identified as employing either integrated or collection codes might no longer exhibit these attributes. A strict monitoring of the classes in terms of content classification was therefore conducted during the period of data collection and is reported in Appendix D.

As pointed out above an attempt was made to control for extraneous variables by having the same teacher and to the extent possible the same students involved in the collection class and the integrated class which together composed any one case. On the other hand, no attempt whatsoever was made to control for differences between and among the distinct case studies which, it must be reemphasized, were conducted separately and independently by a team of five trained observers. The rationale for not attempting to control for differences among case studies was that should differences between the instructional systemics associated with collection codes and with integrated codes be observed to exist under a variety of different circumstances, then the strength of "knowledge organization" as the leading element in the system would be clearly demonstrated.

The ultimate composition of the five case studies involved 10 classes, five of which were grade eleven social studies and five of which were grade eleven social science options. The five option classes were two

sociology, two geography and one psychology. All the teachers were male, ranging in experience from one year to twelve years, and in academic qualifications from having three years of university to the possession of a master's degree. The five cases were located in four schools. Two of the case studies were conducted in a large suburban school, two were conducted in medium size schools in small towns, and one was conducted in a small rural school. In total the study involved 186 students ranging in age from 14.8 to 18.7 years from a wide range of socioeconomic backgrounds, with approximately equal numbers of males and females.

PROCEDURES

Data were collected using two instruments developed specifically for the study. The System for the Analysis of Classroom Transactions is a multi-dimensional category system designed to permit the quantitative description of classroom transactions in terms of instructionally relevant variables by means of direct observation. The Instructional Resonance Questionnaire is an instrument which permits students to record their perceptions of their classes with respect to instructional resonance.

System for the Analysis of Classroom Transactions

The SACT was developed in order to permit a description of classroom behavior in terms of instructional intent, conditions of "knowing that," form of inquiry, and paradigm of activity, each of which is represented in the system of dichotomous categories (see Table 1).

Table 1

Dimensions and Categories of the SACT

Dimensions	Categories
INSTRUCTIONAL INTENT	Knowing How Knowing That
CONDITIONS OF "KNOWING THAT"	Strong Weak
FORM OF INQUIRY	Evaluative Non-Evaluative
PARADIGM OF ACTIVITY	Teacher-Centered Group-Regulated

For the most part, the designation of the major dimensions of the system as "instructionally relevant" has been on an *a priori* theoretic basis (as described in

Chapter 3, Part one) with the exception of the dimension named "paradigm of activity" for which an empirical basis has been long established. Nevertheless, some of the system's categories do have a correspondence to parts of presently existing systems. For example, the SACT categories of "knowing how" and "knowing that" correspond to the "skills-content" dimension of Gallagher's (1967) Topic Classification System; "'knowing that' in its strong and weak senses" is a major focus of the opining and inquiry dimensions of the Michigan Social Issues Cognitive Category System (Massialas et al., 1975); and a concern for "evaluative" inquiry is reflected in the logic of teaching studies conducted by Smith et al. (1963).

The Unit of Analysis

Any research employing systematic classroom observation requires that a unit be established for the purposes of analysis. The unit of analysis employed may be either arbitrary units of time or selected naturally occurring units (Biddle, 1967). Arbitrary units of time are associated with Flander's system and many of its variants which require that observers make a judgment every three seconds, and with Medley and Mitzel's (1963) system which demands that a record of signs by kept during three minute units.

Naturally occurring units may be either analytic or phenomenal. Analytic units have become increasingly

used in much classroom observational research. The "episode" as employed by Smith et al. (1963), Bellack's (1966) "teaching cycle," and Gallagher's (1967) topic, are examples of analytic units. Generally speaking they may be regarded as completed units of usually verbal transaction. When the focus of attention moves to a new aspect of a topic or to a new subject one unit is considered to have ended and another to have begun.

Phenomenal units are similar to analytic units to the extent that they too are composed of completed transactions. Such units are chosen for study, however, because they exhibit those characteristics in which the researcher is particularly interested. Kounin (1970), for example, has chosen the misbehavior-desist event of classroom management as the unit of study, and recording and encoding procedures relate only to it.

In the SACT the units of analysis are "analytic" in nature and are referred to as ventures. This latter term is used to delineate a unit of classroom interaction which focuses upon a single notion or subject or topic. When there is a shift away from one focus of attention to another, (from one topic to another, or from one aspect of a topic to another), a change in ventures has taken place. Typically, a social studies or social science class of approximately 80 minutes can be expected to

produce between 15 and 30 ventures.[1]

Classification of Ventures

As indicated previously, each venture may be classified along each of the four dimensions of the system. For example, in a venture which consists of student A asking student B to justify his assertion that Canada should prohibit further immigration by people of non-white racial origin, the pattern of classification would be: (i) knowing that, (ii) strong sense, (iii) evaluative inquiry, and (iv) group-regulated. However, since the SACT is a category system, observers are frequently called upon to make judgments which require high degrees of inference. In order to increase the validity and reliability of such high inference judgments, a number of "significant indicators" (in effect, low level signs) for each category have been identified to provide guidance for observers. These are included in the Guidelines for Observers (Appendix A). It is important that users of the system appreciate that the examples, instances, and significant indicators provided in the Guidelines are intended to be illustrative rather than exhaustive of the empirical referents of the categories.

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[1]Specific guidelines for the identification of ventures is provided in System for Analyzing Classroom Transactions: Guidelines for Observers (Appendix A).

Validity of the SACT

A measure of (a) the observability of the behaviors, and (b) the objectivity of the SACT, was obtained from a coefficient of inter-observer reliability calculated on data provided by four untrained observers. The four untrained observers, who along with the researcher were to eventually collect the data for the study, were each required to code the same fifteen minute segment of classroom interaction. The observers coded from an audio-recording supplemented by typescript. They had been provided with only the names of the categories and a single statement description of the attributes of each category (Appendix C). The coefficients of inter-observer reliability yielded ranged from 0.56 to 0.81 with a median of 0.66.[2] The level of inter-observer agreement

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[2]The coefficient of inter-observer reliability was arrived at using procedures advocated by Smith, Meux, Coombs and Nuthall, in "A Tentative Report on the Strategies of Teaching," Bureau of Educational Research, College of Education, University of Illinois, Urbana, n.d., p. 41.

$$C = \frac{A_1 + A_2}{B_1 + B_2}$$

C = Coefficient of agreement
A_1 = The number of ventures assigned to a particular category by observer #1 which are also assigned the same category by judge #2.
A_2 = The number of ventures assigned to a particular category by observer #2 which are also assigned the same category by judge #1.
B_1 = The total number of ventures identified by observer #1.
B_2 = The total number of ventures identified by observer #2.

was taken to indicate that the behaviors were readily observable to even untrained observers and that a fair degree of objectivity could be achieved without training. However, it should be noted that while untrained in the use of SACT, the observers were all social studies teachers pursuing graduate study in the field.

An adequate degree of content and construct validity, in addition to face validity, is claimed for the SACT. The question of content validity must inevitably focus upon the "significant indicators" of categories rather than the categories themselves since the two categories in each dimension do comprise the total behaviors of the dimension. Content validity may be claimed for the indicators on two bases. In the first instance sets of indicators were derived in a rational-deductive manner from the main categories and transcripts of classroom interactions coded accordingly. When ventures occurred for which these indicators did not provide guidance, further suitable indicators were developed, the method in this instance being empirical-inductive. Construct validity is claimed on the basis of the categories themselves rather than the "significant indicators." The pragmatic and heuristic value of the categories has been argued at length in Chapter 3, Part One.

Reliability

The inter-observer reliability indicated above

was for untrained observers. The data were collected by the researcher and four trained observers. Training took place in 11 sessions for a total of approximately 15 hours, during which the observers had experience in coding from scripts, audio tapes, and video tapes, and various combinations of the three. At the end of the training period inter-observer reliability ranged from 0.93 to 1.00 with a median of 0.97 (see Figure 1 and Table 2).

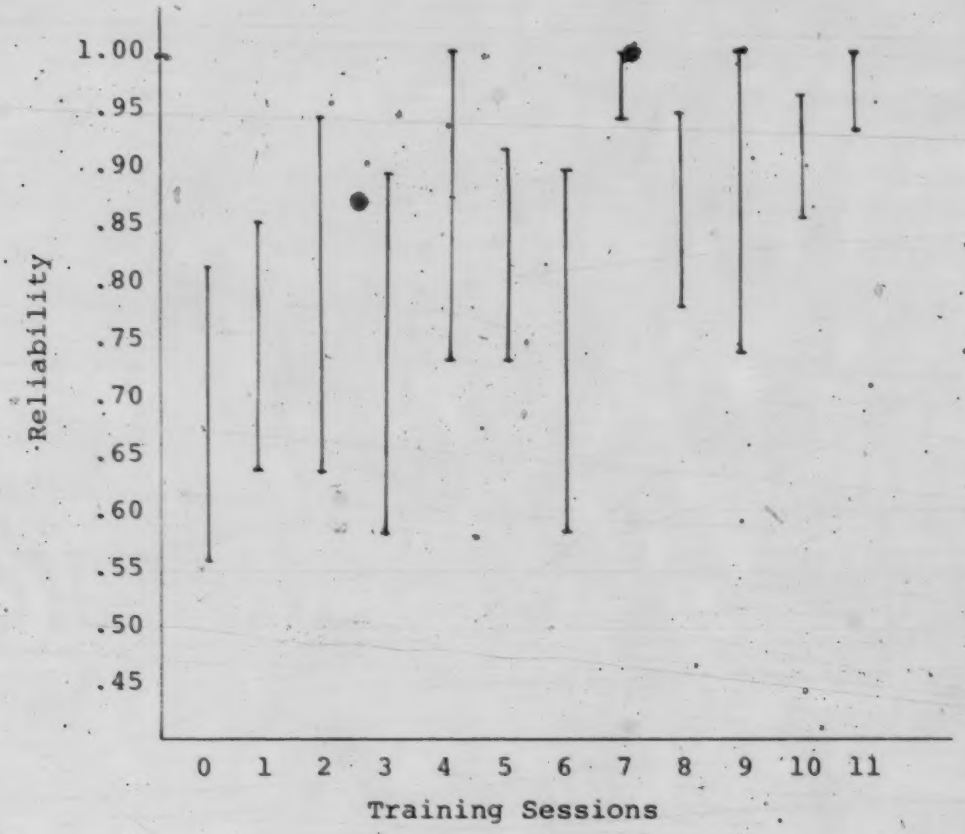

Figure 1

Ranges of Inter-Observer Reliability During Training

Measures of intra-observer reliability were also taken during the training period and during the course of data collection. Intra-observer reliability calculated over a ten day interval during the latter part of observer training yielded coefficients ranging from 0.91 to 1.00 with a median of 0.98. In a ten day period after data collection had begun the range was 0.93 to 1.00 with a median of 0.98. At the end of the fifty-day period during

Table 2

Inter-observer Reliability After Approximately 15 Hours of Training

Observer	I	II	III	IV	V
I					
II	.98				
III	.95	.98			
IV	.98	1.00	.98		
V	.93	.95	.93	.95	

which data was collected the range of intra-observer reliability was 0.93 to 0.98, with a median of 0.95.

Inter-observer reliability was also calculated at the end of the period of data collection, and the range obtained being from 0.76 to 0.97, with a median of 0.81. No training sessions were held during the period of data collection. While inter-observer reliability at the

end of the period of data collection was still adequate, the decline in reliability is clear evidence of instrument decay over time.

Table 3

Inter-observer Reliability after 50 Days of Data Collection

Observer	I	II	III	IV	V
I					
II	.94				
III	.79	.76			
IV	.79	.82	.77		
V	.97	.89	.82	.76	

Instructional Resonance Questionnaire

The Instructional Resonance Questionnaire (Appendix B) consists of 23 items, each a 5-point rating scale from "strongly agree" to "strongly disagree," designed to provide a measure of a student's perception of instructional resonance. The questionnaire is composed of three parts. The first focuses upon relevance resonance, the second upon intellectual resonance, and the third upon experiential resonance. The total of a student's scores on each of these dimensions provides a measure of his perceptions of instructional resonance.

Derivation of Items

The items for the IRQ were derived following procedures advocated by Lunn (1969). Interviews were held with three groups of grade eleven students (total number = 32) who would not be involved in the main study. The students were invited to talk about their reactions to the social studies courses which they had taken or were taking at that time. The students were asked to focus their comments on three questions: (i) how relevant was the course? (ii) how difficult was the course? (iii) how interesting was the course? Each of these questions was considered to be the focal aspect of relevance resonance, intellectual resonance and experiential resonance, respectively. The discussions between researcher and students were audio-recorded and from the recordings a pool of statements reflecting student reaction to their social studies courses was compiled. It was these statements which comprised an original pool of 32 items for the IRQ, and, of these, 23 survived the item selection procedures.

Item selection procedures involved the administration of the 32-item questionnaire to a class of 28 grade eleven students who would not be involved in the main study. In addition to completing the questionnaire, these students were asked to identify any item which they felt was unclear or ambiguous in its meaning. Any item so marked by five or more students was omitted from the

final version of the questionnaire which consisted of 23 items.

Validity

Adequate degrees of face and content validity are claimed for the Instructional Resonance Questionnaire. Both types of validity are claimed on the basis of the procedures employed to derive items. With respect to face validity the procedures ensured that the items had at least the appearance of providing measures of the three dimensions of the questionnaire. With respect to content validity, it was felt that the procedures employed to develop the items provided the best possible assurance that the questionnaire items would indeed be a representative sample of "the behavior domain to be tested [Anastasi, 1968, p. 100]," since the interview technique provided the researcher with the opportunity to identify a number of different aspects of the "domain."

While the three major dimensions of instructional resonance were identified on a rational-deductive basis by the researcher, after the fact empirical support has been provided by Permut (1974) whose factor analytic study showed that students' interpretations of the idea of relevance do not incorporate the notions of "difficulty" and "interest," the focal points of intellectual and experiential resonance, respectively. However, the relatively high level of internal consistency of the IRQ tends to suggest

a single underlying factor (Table 4).

Reliability. An estimate of internal consistency was calculated for each of the three dimensions of the instrument and for the instrument overall using the Kuder-Richardson 20 procedure.

Table 4

Estimates of Inter-item Reliability

Relevance Resonance (items 1-8)	r = 0.88
Intellectual Resonance (items 9-16)	r = 0.57
Experiential Resonance (items 17-23)	r = 0.77
Overall (items 1-23)	r = 0.89

The K-R 20 reliability coefficients were calculated on data provided by 47 grade eleven students not involved in the main study.

Data Collection

Data for the study were collected using the System for Analyzing Classroom Transactions and the Instructional Resonance Questionnaire.

The SACT was used by five trained observers each of whom conducted one of the case studies which comprised the design. The "collection" class and the "integrated" class making up each case were observed for approximately

400 minutes each (5 class periods of approximately 80 minutes) for a total period of observation in each case study of approximately 800 minutes. The class periods selected for observation were from among those in which there was to be a high degree of teacher-student interaction.* Observation took place during the Spring semester of 1974. For the most part classroom operations were coded directly by the observer while in the classroom. However, recordings were made of each class in order to provide the observer with the opportunity to check his codings and to re-examine any particularly difficult aspect of classroom operations. During the period of data collection, the teachers and students who co-operated in the study were totally unaware of the major focus of the research and of the dimensions of classroom behavior to be observed.

During the last week of the period of data collection, the IRQ was administered to all students participating in the study. The questionnaire was administered by the observer who had been associated with the class concerned, and students were assured that their individual responses would not be shown to their teachers or anyone connected with their school.

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*However the classes observed did not constitute a random sample selected from all possible classes.

Chapter 5

RESULTS

The study was designed to investigate the hypothesis that there exists a relationship between the manner in which knowledge is organized for instruction and the properties exhibited by the instructional system in which it is situated. Conducted within the framework of an abstracted instructional system, educational knowledge codes of the collection and integrated types were designated as the modes of knowledge organization to be investigated. The dimensions of classroom experience (systemic elements) posited as existing in a relationship with the knowledge organization employed were: (a) instructional intent, (b) the conditions of "knowing that," (c) the form of inquiry, (d) the paradigm of activity, and (e) instructional resonance. A specific sub-hypothesis pertaining to each of the systemic elements was formulated to guide the study (pp. 14-15).

In order to test the research hypothesis a series of five distinct and independently conducted case studies was carried out. In each of the cases there was one collection class and one integrated class. Data were collected by trained observers using the System for Analyzing Classroom Transactions, and by means of the

Instructional Resonance Questionnaire, and were subjected to chi-square and t-test analyses, respectively.

FINDINGS

In the analysis of data pertaining to (a) instructional intent, (b) the conditions of "knowing that," (c) the form of inquiry, and (d) the paradigm of activity, the unit of analysis was that unit of classroom discourse referred to in the study as a "venture."

Instructional Intent

In none of the five case studies was there found to exist a relationship between the educational knowledge code employed and the relative emphasis placed upon instructional intent of the "knowing how" type and instructional intent of the "knowing that" type. In both classes employing collection codes and classes employing integrated codes there was almost exclusive attention given to instructional intent of the "knowing that" type. In two of the case studies (I and V) there was not a single instance of a "knowing how" venture in either the collection class or the integrated class, and of a total of 1153 ventures analyzed in the five case studies only 24 (approximately 2 percent) were classified as "knowing how" (Table 5).

It should also be noted that while there were

Table 5

Chi-Square Test of Independence between Knowledge Organization and Instructional Intent

Knowledge Organization	Total Number of Ventures	Instructional Intent		χ^2
		knowing how	knowing that	
Case Study I				
Integrated	109	0	109	
Collection	94	0	94	--
Case Study II				
Integrated	108	5	103	
Collection	116	0	116	3.58
Case Study III				
Integrated	133	10	123	
Collection	130	6	124	0.53
Case Study IV				
Integrated	149	1	148	
Collection	73	2	71	0.40
Case Study V				
Integrated	124	0	124	
Collection	117	0	117	--

Critical value of χ^2 (df = 1) at $p < 0.05 = 3.84$.

statistically significant differences in the relative emphasis placed upon "knowing how" and "knowing that" between the case studies for both the integrated and the collection classes ($p = <.01$ and $<.001$, respectively), these can scarcely be considered important (Table 6). In the class in which greatest attention was given to "knowing how" (the integrated class in Case Study III), only 8 percent of all ventures were classified as "knowing how."

Discussion

The finding that the dominant instructional intent in integrated classes (social studies) and collection classes (social sciences) was "knowing that," to the virtual exclusion of "knowing how," is similar to Gallagher's (1967) findings related to the BSCS curriculum. Indeed, the analysis indicates an even greater neglect of "knowing how" (process) than was the case in the classes in Gallagher's study. The finding further suggests that, in spite of the considerable attention given to a concern for process ("knowing how") in the literature of social studies education, little explicit consideration manifests itself in the classroom, lending support to Soltis's (1968) and Holloway's (1975) assertions that as far as classroom experience is concerned, "knowing that" is viewed as the basic type of knowing.

Further, the finding that both the integrated and

Table 6

Chi-Square Test of Independence among Classes: Instructional Intent

Integrated Classes	Total Number of Ventures	Instructional Intent	
		Knowing how	Knowing that
I	109	0	109
II	108	5	103
III	133	10	123
IV	149	1	148
V	124	0	124

$\chi^2 = 17.92$
df = 4
p = <.01

Collection Classes	Total Number of Ventures	Instructional Intent	
		Knowing how	Knowing that
I	94	0	94
II	116	0	116
III	130	6	124
IV	73	2	71
V	117	0	117

$\chi^2 = 34.19$
df = 4
p = <.001

the collection classes were equally dominated by "knowing that" ventures in all five cases does not lend support to Keller's (1968) claim that an interdisciplinary perspective (integrated educational knowledge code) will promote "inquiry and discovery [aspects of "knowing how"], instead of . . . rote memory and regurgitation [aspects of "knowing that"]." Therefore the hypothesis that there exists a relationship between the knowledge code employed in an instructional situation and the relative emphasis given to "knowing how" and "knowing that," as dimensions of instructional intent was rejected.

The Conditions of "Knowing That"

In three of the case studies (I, II and III) there was no difference between the integrated and collection classes with respect to the emphasis placed upon "knowing that" in the strong sense and "knowing that" in the weak sense. In case studies IV and V differences were found to exist ($p = <.01$ and $<.001$ respectively). In both of these latter instances it was found that ventures categorized as "knowing that" in the weak sense occurred to significantly greater degree in the integrated classes, though in both cases the number of "weak" ventures was fewer than 20 percent of the total (Table 7). This was a significantly smaller proportion of the total than in case studies II and IV in which no differences were found

Table 7

Chi-Square Test of Independence between Knowledge Organization and the Conditions of Knowing That

Knowledge Organization	Total Number of Ventures	Conditions of Knowing That		χ^2
		Strong Sense	Weak Sense	
Case Study I				
Integrated	109	74	35	
Collection	94	69	25	0.50
Case Study II				
Integrated	103	103	0	
Collection	116	112	4	1.95
Case Study III				
Integrated	123	90	33	
Collection	124	98	26	0.87
Case Study IV				
Integrated	148	130	18	
Collection	71	71	0	7.87*
Case Study V				
Integrated	124	104	20	
Collection	117	117	0	18.51**

* $p = < .01$
** $p = < .001$

between the collection and integrated classes (Table 8).

Discussion

It was hypothesized that there exists a relationship between the knowledge code employed in an instructional situation and the relative emphasis given to "knowing that" in the weak sense and "knowing that" in the strong sense. However, the findings suggest that there is no necessary systematic variation in the relative emphasis placed upon "knowing that" in its strong and weak senses related to the knowledge code employed. The hypothesis is, therefore, rejected.

Any imputation, then, of 'soft pedagogy' to classrooms employing integrated knowledge codes, as "discipline-oriented" educators sometimes suggest, would seem untenable, or at least it may be argued that the pedagogy is no more 'soft' than in collection classes. Case study II would seem to indicate that when teachers and students pursue a process of inquiry, whether using an integrated or collection knowledge code, there may be very few instances of "knowing that" in the weak sense, while, on the other hand, case studies I and III indicate that there may occur a considerable number (Table 7).

While in cases IV and V statistically significant differences were observed in the conditions of "knowing that" between the integrated and collection classes, the absence of differences in cases I, II and III suggests

Table 8

Chi-Square Test of Independence among Classes: Conditions of Knowing That

Integrated Classes	Total Number of Ventures	Conditions of Knowing That	
		Strong	Weak
I	109	74	35
II	103	103	0
III	123	90	33
IV	148	130	18
V	124	104	20

$\chi^2 = 45.29$
df = 4
p = .001

Collection Classes	Total Number of Ventures	Conditions of Knowing That	
		Strong	Weak
I	94	69	25
II	116	112	4
III	124	98	26
IV	71	71	0
V	117	117	0

$\chi^2 = 63.38$
df = 4
p = .001

the necessity of seeking an alternative hypothesis for the differences which obtained in case studies IV and V.

The Forms of Inquiry

In four of the case studies it was found that a significantly greater emphasis was placed upon evaluative inquiry in the integrated classes than was the case in the collection classes. However, while statistically significant differences between the integrated and collection classes were observed, it should be noted that in both classes of all five case studies a much greater proportion of the total number of ventures were classified non-evaluative than was classified evaluative (Table 9).

Again it was found that there was considerable variation among the case studies, for both the collection and integrated classes, with respect to the relative attention given to the two forms of inquiry ($p = < .001$ for both codes). In the collection classes in two of the cases (IV and V) there were no ventures categorized as evaluative, while in the collection classes of cases II and III approximately 15 percent of the ventures were categorized as evaluative. Similar variations were found among the integrated classes (Table 10).

Discussion

The fact that significant differences in the form of inquiry were found to exist between the collection and

Table 9

Chi-Square Test of Independence between Knowledge Organization and Form of Inquiry

Knowledge Organization	Total Number of Ventures	Form of Inquiry		χ^2
		Evaluative	Non-evaluative	
Case Study I				
Integrated	109	36	73	
Collection	94	9	85	14.76**
Case Study II				
Integrated	108	8	100	
Collection	116	15	101	1.3
Case Study III[1]				
Integrated	133	32	101	
Collection	130	18	112	3.82*
Case Study IV				
Integrated	149	13	136	
Collection	73	0	73	5.27*
Case Study V				
Integrated	124	16	108	
Collection	117	0	117	14.2*

* $p = < .05$
** $p = < .001$

[1]While the obtained value of χ^2 (3.82) in this case is slightly less than the critical value of χ^2 at $p = .05$ and $df = 1$ (3.84), it was accepted as representing a significant difference since the use of the Yates's correction for continuity in this instance has probably resulted in a conservative estimate of χ^2.

Table 10

Chi-Square Test of Independence among Classes: Form of Inquiry

Integrated Classes	Total Number of Ventures	Form of Inquiry	
		Evaluative	Non-Evaluative
I	109	36	73
II	108	8	100
III	133	32	101
IV	149	14	136
V	124	16	108

$\chi^2 = 37.43$
df = 4
$p = <.001$

Collection Classes	Total Number of Ventures	Form of Inquiry	
		Evaluative	Non-Evaluative
I	94	9	85
II	116	15	101
III	130	18	112
IV	73	0	73
V	117	0	117

$\chi^2 = 23.06$
df = 4
$p = <.001$

integrated codes in four of the case studies would seem to lend some measure of support to the hypothesis that there exists a relationship between the knowledge code employed in an instructional situation and the relative emphasis given to evaluative inquiry and non-evaluative inquiry. However, the validity of this interpretation is highly questionable in view of the presence of a confounding variable. Specifically, the Province of Alberta social studies curriculum is one which is explicitly "valuing-oriented," and the observation that a significantly greater number of evaluative ventures occurs in the integrated classes, all of which were social studies classes, may be related more to the specific values-orientation of the curriculum than the knowledge code employed. On the other hand an absence of differences in the form of inquiry between the integrated and collection classes would have resulted in a rejection of the hypothesis. The results obtained must be treated cautiously, indicating only that further investigation and not acceptance of the hypothesis is warranted.

While not directly related to the research hypothesis, it is perhaps important to note from the analysis that students and teachers in the integrated classes, and to a lesser extent, in the collection classes, do engage in a consideration of value questions to a considerable degree. This does not support Katz's (1974)

claim that Canadian children are "sacrificed on altars of barren facts called curricula devoid of the values which give them meaning," at least to the degree that the ten classrooms investigated are typical of the experiences of Canadian children. One would tend to suspect, however, that the considerable attention given to values and valuing curricula in Alberta during the past eight years might mean that the classes investigated would be atypical with respect to the total Canadian context.

Paradigm of Activity

In all five case studies significant differences were found to obtain between the collection and integrated classes in terms of the proportion of ventures classified as teacher-centered or group-regulated ($p = <.05$ in Case III; $<.01$ in Case II; and $<.001$ in Cases I, IV and V). In four of the cases it was found that group-regulated ventures occurred to a significantly greater extent in the integrated classes than in the collection classes. In a single case (Case study II), it was found that the group-regulated ventures occurred to a significantly greater degree in the collection class (Table 11).

Once again considerable differences among the cases were observed for both the integrated and collection classes ($p = <.001$). For example, in the integrated class of Case IV approximately 65 percent of the total

Table 11

Chi-Square Test of Independence between Knowledge Organization and the Paradigm of Activity

Knowledge Organization	Total Number of Ventures	Paradigm of Activity: Teacher-centered	Paradigm of Activity: Group-regulated	χ^2
Case Study I				
Integrated	109	43	66	
Collection	94	81	13	44.4***
Case Study II				
Integrated	108	69	39	
Collection	116	51	65	8.1**
Case Study III				
Integrated	133	87	46	
Collection	130	102	28	4.91*
Case Study IV				
Integrated	149	54	95	
Collection	73	55	18	28.43***
Case Study V				
Integrated	124	79	45	
Collection	117	104	13	19.52***

* $p = <.05$
** $p = <.01$
*** $p = <.001$

number of ventures were classified as group-regulated, whereas in the integrated classes of Case Studies II and V approximately 36 percent of all ventures were classified as group-regulated (Table 12). In each instance, however, there was a significantly greater number of group-regulated ventures than teacher-centered ventures.

Discussion

In finding that in four of the case studies there was a significantly greater number of group-regulated ventures than teacher-centered ventures, would appear to lend a measure of support to the hypothesis that there exists a relationship between the knowledge code employed and the relative emphasis placed upon teacher-centered activity and group-regulated activity.

The proportion of teacher-centered to group-regulated ventures in the collection classes tends to confirm the findings of Bellack (1966) and Marie Hughes (1968) that teachers make little use of student ideas and that the fundamental paradigm of classroom activity is one of teacher initiation and student response. On the other hand, the findings in the integrated classes tend to suggest that while the teacher clearly exerts a controlling influence over a considerable proportion of instructional ventures, a significantly greater number of ventures are regulated by the group. The evidence from the case studies might be construed legitimately to indicate that the

Table 12

Chi-Square Test of Independence among Classes: Paradigm of Activity

Integrated Classes	Total Number of Ventures	Paradigm of Activity	
		Teacher-centered	Group-regulated
I	109	43	66
II	108	69	39
III	133	87	46
IV	149	54	95
V	124	79	45

$\chi^2 = 40.13$
df = 4
p = .001

Collection Classes	Total Number of Ventures	Paradigm of Activity	
		Teacher-centered	Group-regulated
I	94	81	13
II	116	51	65
III	130	102	28
IV	73	55	18
V	117	104	13

$\chi^2 = 73.58$
df = 4
p = .001

collection classes, deriving their knowledge organization from the scholarly disciplines, and being mediated by teachers with perhaps limited conceptions of the nature of the subject, may indeed be more constraining than integrated classes in terms of the possibilities afforded in the instructional situation.

Instructional Resonance

Data relevant to instructional resonance were collected using the Instructional Resonance Questionnaire (Appendix D) and were subjected to t-test analysis. In only Case Study III were students' perceptions of instructional resonance found to differ between the collection class and the integrated class (Table 13). In this instance the students perceived instructional resonance to be significantly greater ($p = <.01$) in the integrated rather than the collection class.

The range of mean scores, i.e., 73.37 to 86.67 in the integrated classes, and 74.59 to 82.5 in the collection classes, tends to indicate that students are equally ambivalent towards both the integrated and collection classes in terms of their perceptions of instructional resonance.

Discussion

The lack of systematic variation in terms of students' perceptions of instructional resonance between

Table 13

Comparison of Students' Perceptions of Instructional Resonance in Integrated and Collection Classes

Integrated Classes			Collection Classes				
N	$\bar{X}$	s	N	$\bar{X}$	s	df	t
			Case Study I				
23	85.91	8.29	16	82.50	9.38	37	1.17
			Case Study II				
22	80.45	13.56	14	82.00	9.94	34	0.36
			Case Study III				
15	86.67	6.24	17	79.24	7.69	30	2.88*
			Case Study IV[1]				
19	73.37	16.12	20	79.70	9.43	31	0.33
			Case Study V				
19	79.05	12.34	22	74.59	9.55	39	1.27

* $p = <.01$

[1]In Case Study IV there was a lack of homogeneity of variables. The statistical test was performed, therefore, using t^1 and Welch's correction for degrees of freedom (Winer, 1971, p. 42).

the integrated and collection classes led to a rejection of the hypothesis that the degree of instructional resonance displayed in an instructional situation would be directly related to the knowledge code employed.

The finding is particularly interesting when considered in conjunction with those findings related to the form of inquiry and the paradigm of activity. There has been a tendency in much social studies discourse to assume that when there is a consideration of evaluative as well as non-evaluative questions, and that when students exert a considerable influence in the determination of the focus of inquiry, then there will inevitably be significantly higher levels of resonance between the student and the classroom experience. The findings of the present study do not seem to lend support to that assumption. In three of the case studies (I, IV and V), there were significantly greater numbers of ventures classified as "evaluative" and "group-regulated" in the integrated than in the collection classes ($p = <.001$ in each instance except for "form of inquiry" in Case Study IV in which $p = <.05$), but in each instance there was no difference in the students' perceptions of the level of instructional resonance in classes using the integrated and in classes using collection knowledge codes.

A SYSTEMS SUMMARY OF THE FINDINGS

Within the context of a systems framework the study was essentially one of systems analysis, i.e., defining the problem. The investigation proceeded by specifying a set of elements which would comprise the system to be investigated. Focusing upon the macroscopic behavior of the system as a whole, as opposed to the microscopic behavior of the systemic elements or subsystems, the investigation sought to describe the nature of some of the relationships obtaining among the selected elements, in particular the dyadic relationship between the educational knowledge code employed in an instructional situation and each of the other systemic elements. Specifically the study sought to determine whether the system tended toward centralization, centering on a single leading part, and the hypothesis formulated to guide the investigation was that "the system abstracted would function as a centralized system, centering on a leading part called the knowledge code [p. 14]."

In order for the hypothesis to prove tenable it would have to be observed that a change in the hypothesized leading element would be "reflected throughout the system, causing considerable change [Hall and Fagen, 1956, p. 22]," and having a trigger effect with a small change being amplified in the total system.

The findings of the study showed that the research

hypothesis was untenable in its totality. The results clearly indicated that instructional intent, the conditions of "knowing that," and instructional resonance did not center on the educational knowledge code employed in the instructional situation, i.e., the relationship between each of these systemic elements and the educational knowledge code employed is best described as tending toward independence. On the other hand, it may be pointed out that the results did not indicate a total lack of systemic coherence. The findings suggest that the form of inquiry (keeping in mind the possibility that the results were confounded by the values-orientation of the Alberta social studies curriculum), and the paradigm of activity may indeed tend to center on the educational knowledge code employed. However, the latter relationships, i.e., those involving the form of inquiry and the paradigm of activity, have shown themselves to be highly stochastic in nature, so that it is difficult to make an "if A then B" statement. But it does seem that if A, then B may obtain with a sufficient degree of regularity, that the information is heuristically valuable.

Chapter 6

SUMMARY, CONCLUSIONS, AND SUGGESTIONS FOR FURTHER RESEARCH

SUMMARY

The Problem

The focus of investigation derived from a concern, frequently expressed in the realm of curriculum discourse, that the traditional separate-subjects approach to organizing knowledge for instruction is no longer solely adequate to the process of education, that there is a need to proceed beyond curriculum design which has been described as "a process of layering society's new knowledge and arranging for feeding it . . . [McClure, 1971, p. 51]." The argument usually advanced by opponents of the separate-subject approach is that the separate subjects are fragmentary and compartmentalized, and, that together with other societal tendencies toward specialization, they have resulted in a "depersonalization and demoralization, disintegration and disorientation, the brink of world holocaust and the brink of ecological suicide, the alienation of institutionalized man and the deprivation of the human spirit [Haas, 1975, p. 5]." The condemnation of the separate-subjects approach to

curriculum organization has been followed usually by a demand for a conception of knowledge in the curriculum which is frequently called "integrated," and which, by implication, would have the opposite and more positive effects.

However, in spite of the "rhetoric of conclusions," no evidence of an empirical nature has been advanced to suggest that the manner in which knowledge is organized in any way constrains the possibilities afforded in the instructional situation. Assuming that if differential effects in terms of outcomes are to obtain, then there ought to obtain also differential effects in terms of learning experiences, the present study sought to determine whether there exists a relationship between the manner in which knowledge is organized for instruction and the properties exhibited by the instructional situation in which it is located. Essentially the task was one of determining whether a student's learning experience was likely to differ in terms of the variables relevant to the study as a result of being exposed in an instructional situation to one type of knowledge organization as opposed to another.

Two knowledge organizations, referred to as educational knowledge codes of the collection and integrated types respectively, were designated for investigation. The codes are to be distinguished essentially in terms of

the notion of "classification of content." A collection code predominates where classification is strong, i.e., where contents are clearly bounded and standing in a closed relation to each other. An integrated code predominates where classification is weak, i.e., where boundaries between subject areas are weak and standing in an open relation to each other. Essentially a collection code focuses upon a single domain of the universe which it characterizes in terms of a network of facts, concepts, generalizations, theories etc., while an integrated code focuses upon a problem which it examines from more than a single perspective.

Five instructionally relevant variables were identified, namely, instructional intent, the conditions of "knowing that," the form of inquiry, the paradigm of activity, and instructional resonance, and it was hypothesized that each of these would vary systematically in their major characteristics according to whether a collection or integrated knowledge code was employed in the instructional situation.

Method

Conducted within a systems framework, the study involved five separate and independently conducted naturalistic and quantitative case studies. The relationships between the educational knowledge code employed and

the systemic elements (the instructionally relevant variables) were described and invariances across cases were mapped.

The sample, selected by means of judgmental sampling, consisted of ten intact grade eleven classes, five of which employed integrated codes and five of which employed collection codes. Integrated classes were selected from classes following the social studies 20 course, and collection classes were selected from classes following the geography 20, psychology 20, and sociology 20 courses. In each case study there was one integrated class and one collection class. Both were taught by the same teacher.

Data pertaining to (a) instructional intent, (b) the conditions of "knowing that," (c) the form of inquiry, and (d) the paradigm of activity, were collected through systematic classroom observation by five trained observers using the System for Analyzing Classroom Transactions. Data pertaining to instructional resonance were obtained from student responses on the Instructional Resonance Questionnaire. Both instruments were developed specifically for the purposes of the study. Classroom observation data were subjected to chi-square analysis, and student responses to t-test analysis.

Findings

The study resulted in no evidence to suggest that (a) the instructional intent, (b) the conditions of "knowing that," or (c) the instructional resonance obtaining in any instructional situation, is in any way related to the knowledge code employed, i.e., the relationships may be described as independent. There was evidence to suggest that the form of inquiry and the paradigm of activity obtaining in an instructional situation, may be related to the knowledge code employed, i.e., the relationships may be described as interdependent. The latter findings, however, were by no means conclusive.

CONCLUSIONS

The findings of the study indicate that assertions of a general nature (blanket statements) that there exist relationships between the educational knowledge code employed in an instructional situation and the general systemic configuration are unwarranted. For some dimensions of the multi-dimensions of classroom experience the relationships obtaining with the code employed tend toward independence, while others tend toward interdependence.

The findings also support the conclusion that the knowledge code employed does not function as a leading part in a centralized system. While the ideas of a

leading part and centralization in an instructional system are attractive in so far as they provide greater potential for control and manipulation, the findings of the present study give no indication that the instructional system considered tends toward centralization.

The finding that there was considerable variation in the properties displayed by the instructional situations between case studies emphasizes the need to recognize that in instances where a relationship is observed to exist between the educational knowledge code employed and one of the systemic elements, it ought not to be viewed as a necessary or causal relationship. The systemic elements considered in the present study, including the educational knowledge code, are clearly constitutive as opposed to situational in nature, i.e., they are amenable to manipulation and control as opposed to 'fixed.' From this premise it may be concluded that "systems designers" may actively intervene in the system to accentuate some relationships and depress others.

While not directly related to the research problem, the findings inevitably lead to the drawing of conclusions concerning the nature of 'social studies' teaching as it is evidenced by the classrooms investigated. Foremost among these derives from the observation that there was a virtual absence of "knowing how" ventures (a process orientation) in both the integrated and collection classes.

The observation may be explained by suggesting that (i) a process orientation is not considered important by the teachers involved, or (ii) the development of process abilities is assumed to be an inevitable concomitant of the acquisition of information, or (iii) and perhaps more likely, teachers and students are lacking in the ability to deal with questions of process.

The finding that "knowing that" in the strong sense predominated in all the classrooms investigated, tends to negate the criticism levelled frequently against 'social studies' classes, i.e., that they frequently degenerate into exchanges of mutual ignorances, and there seems to be a general realization that, as Michael Hornyanski has pointed out, "rubbing souls together is not education."

SUGGESTIONS FOR FURTHER RESEARCH

A fundamental presupposition of the study was that it is the transaction occurring between the inquirer and the "display" which is crucial in the instructional situation and suggestions for further research continue to focus on this problem.

The present study may be described briefly as being concerned with the form of knowledge, specifically educational knowledge codes of the collection and integrated types, and the macroscopic behavior of an

instructional system characterized in terms of classroom experience. The suggestions for further research emphasize substance in addition to form, knowledge organizations other than collection and integrated, the microscopic as well as macroscopic investigation of systemic elements, and a focus on outcomes in addition to classroom process.

1. A knowledge organization may be viewed as possessing both form and substance. Whereas the present study focused upon form, it is suggested that studies be undertaken to investigate the substantive dimensions of various knowledge organizations and their effects upon the process of education. For example, the network of facts, concepts, generalizations etc., which comprises any knowledge system, implies a particular world view. There is a need to make explicit the world views which are presently implicit in knowledge organized for the purposes of instruction.

2. The present study focused upon the notions of knowledge organization which have traditionally prevailed in curriculum practice and which may be loosely referred to as disciplines-oriented and interdisciplinary. There is a need to investigate the possibilities afforded by other conceptions of knowledge organization in the instructional situation.

3. Whereas the present study emphasized the macroscopic behavior of the elements of the abstracted

instructional system, it is suggested that a microscopic investigation of selected elements be undertaken. Work of this nature has already been undertaken with respect to the nature of valuing or evaluative inquiry, in particular the work of Meux, and concerning the conditions of "knowing that," by Bellack, Smith and Meux and by Massialas. However, no attempts have been made to associate particular modes of inquiry and ways of knowing, with the knowledge organization employed in the instructional situation. For example, the modes of inquiry and ways of knowing in those realms of meaning Phenix calls empirics, aesthetics and ethics, might vary considerably in their major characteristics.

4. While the systemic elements investigated in the present study represented major dimensions of classroom experience, there is a need to associate outcome measures with the knowledge organizations employed. The difficulty lies in identifying relevant outcomes, particularly if outcomes deriving from various knowledge systems are seen as complementary rather than competing.

CONCLUDING STATEMENT

The debate concerning how knowledge ought to be organized for the purposes of instruction, is inevitably linked to conceptions of how and what people ought to be. Basically there appear to be three assumptions. The

first is that people ought to be "integrated." The second is that the knowledge organization with which any individual transacts is a contributory factor in his process of becoming "integrated." And third, there is the assumption that knowledge organizations which are in themselves more integrated contribute to the integration of individuals to a significantly greater degree than those which are less integrated. However, an interesting question poses itself: Who is the Best Integrator? Knowledge organizations which are already integrated may rob the inquirer of the experience of integrating and may place him in the role of a passive consumer. Knowledge organizations which are not already integrated may force the student into the role of dynamic inquiry seeking to create meaning from the "great, blooming, buzzing confusion."

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APPENDICES

APPENDIX A

SYSTEM FOR ANALYZING CLASSROOM TRANSACTIONS: GUIDELINES FOR OBSERVERS

The System for Analyzing Classroom Transactions is a multi-dimensional category system designed to provide for the description of the behavioral interaction of teachers and students in the classroom setting in terms of instructionally relevant variables. More specifically, the purpose of the system is to indicate (i) the level of instructional intent, (ii) the conditions of "knowing that," (iii) the form of inquiry, and (iv) the paradigm of activity, which predominate in any classroom situation.

The Unit of Analysis

In this system the term venture is used to refer to that unit of classroom discourse subject to analysis. The term is used to delineate a unit of classroom interaction which focuses upon a single notion or topic or subject. Where there is a shift in focus away from one topic to another, or from one aspect of a topic to another, a change in ventures has taken place. Typically a social studies class or a social science class of approximately eighty minutes can be expected to contain between fifteen and thirty ventures. In straightforward cases ventures may be identified directly by the investigator during the course of the class. However, in cases of doubt or difficulty, two or more investigators should make the divisions using the available recordings of the classroom transactions.

Identifying Ventures

The beginning of a new venture may be indicated by a remark or a set of remarks which leads the discussion in a new direction. There may be:

1. A complete change in the topic under consideration.
2. The introduction of a new aspect or part of a topic previously considered.
3. A return to a topic or aspect of a topic previously considered.

Please note however that:

(a) A remark or set of remarks is not indicative of a new venture if it fails to elicit a response and there is a continuation of the topic under consideration before the remark or set of remarks was made, even though it satisfies the other criteria.

(b) A new venture is not indicated if it is clarifying or continuing or repeating what was just said.

(c) A new venture is not indicated by a statement that has been required or sought for by the preceding speaker.

The termination of a venture may be indicated by passing through an overtly terminal phase, or it may be indicated by the abrupt change in focus which signals the opening of a new venture.

1. A summary by either teacher or student.
2. A set of remarks which are designed to cut off the flow of discussion.
3. In the absence of remarks cutting off discussion or summarizing a venture, a venture is taken as terminated by the occurrence of remarks which signal the opening of a new venture.

NOTE:

A. A venture may take the form of either dialogue or monologue.

B. When the investigator is faced with a situation in which he is unsure whether to have one long or two shorter ventures, and he remains unsure after consultation with colleagues, he should tend to divide the controversial section into shorter ventures.

C. Periods of classroom management, i.e., auxiliary comments essential for arranging the learning environment, should be classified as a venture. Please note that such periods may or may not be indicative of a transition from one venture to another.

Classifying the Ventures

As indicated previously each venture may be classified along four dimensions: the level of instructional intent, the conditions of "knowing that," the form of inquiry, and the paradigm of activity.

The Level of Instructional Intent

This dimension of the system refers to two distinctively different goals of instruction. The first, "knowing how," refers to the goal of teaching a student a skill. This could be a physical or motor skill, or more likely in a social studies or social science class, a cognitive skill such as map reading, or how to locate information, or more generally, the skills of using the scientific method. The second goal, "knowing that," refers to the goal of having students acquire a given body of knowledge or information, whether in the form of specific

data or broader generalizations.

In order for a venture to be classified as "knowing how" there should be evidence that the dominant intention of the venture is the development of knowledge of the "knowing how" type. For example, the teacher may explicitly state that it is his intention to teach the students how to do something; or a student may initiate a "knowing how" venture by asking how to perform a certain task; or the teacher may demonstrate how to perform a task; or he may set the students the task of finding out how to do something. Similarly there must be evidence for a venture to be classified as "knowing that." Teachers and students may be involved in describing, explaining, defining, clarifying, evaluating etc.. For example:

(i) A teacher describes a Thesaurus and how it is used before setting the students the task of locating antonyms for a list of words. (knowing how)

(ii) A student asks what is a thesaurus, and it is described to him by another student. (knowing that)

The Conditions of "Knowing That"[1]

This dimension of the system refers to the conditions which must prevail in order that an individual may claim to know something. "Knowing that" in the weak sense

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[1]When a venture has been identified as being of the "knowing how" type, it should not be classified according to the conditions of "knowing that." This cell in the observation schedule should be left vacant.

corresponds solely to having belief (opining), whereas "knowing that" in the strong sense requires something further—for example, the ability to back up a belief in a relevant manner, that is, to bring evidence in its support. A venture should be classified as "knowing that in the weak sense" if it is dominated by opining, by either teacher or students, or by statements of belief which are not supported, or by any sort of assessment, evaluation or judgment which is not backed up by supporting evidence, or where the evidence offered is itself an expression of opinion or judgment which is not supported. A venture should be classified as "'knowing that' in the strong sense" when statements of opinion, belief and assessment are backed up by objective evidence. Please note also that where a venture is of the form where students and teacher are engaged in reporting information derived from other sources, for example statistics related to a nation's relief or demography or climate, and these are derived from an authoritative source, then the venture should be classified as "knowing that" in the strong sense. A venture may be classified as "knowing that" in the strong sense in the absence of a reasoned argument, if the teacher or other members of the class recognize that evidence is necessary but lacking and make a demand for it, e.g., the teacher or student is asked by another class member to support or defend an assertion.

The Form of Inquiry

This dimension of the system refers to whether the focus of inquiry in each venture is evaluative or non-evaluative as outlined in the work of Charles Morris. In evaluative inquiry, the inquirer is concerned with deciding upon a preferential course of behavior, and with identifying those objects and actions which will receive preferential consideration. Non-evaluative inquiry is concerned with what is happening, has happened or will happen. Evaluative inquiry is concerned with what should be, and how that condition should be attained. For example, a venture focussing on the question "Is pollution necessary?" is a non-evaluative venture. Essentially the venture is attempting to ascertain if it is possible to have a situation which is free from pollution. However, a subsequent venture may focus on an aspect of the same problem and ask "Should pollution be tolerated in order that we can maintain our present standard of life?" In this latter case attention has moved toward what to prefer, and the venture is exhibiting an evaluative form of inquiry.

There are two key indicators to ventures exhibiting the characteristics of evaluative inquiry:

(a) there will be statements containing "value terms," e.g., "Albert Schweitzer was a good man." Or "Higher income tax is undesirable."

(b) there will be statements which are prescriptive in nature, e.g., "Taxes ought to be lowered," or "DDT should not be used to kill insects."

Non-evaluative inquiry is characterized by designative statements which may be determined to be true or false; essentially they convey information about phenomena, e.g., "Beethoven wrote nine symphones" or "John A. MacDonald was Canada's first prime minister."

The Paradigm of Activity

This dimension of the system focuses on the nature of the authority relationships existing within the classroom. Where a classroom is teacher-centered, students are seen as ignorant, with little status and few rights. Where a classroom is group-regulated students are viewed as associates-in-learning with teachers. The most obvious teacher-centered ventures are those which are initiated, sustained and terminated by the teacher, and the most obvious group-regulated ventures are those initiated, sustained and terminated by students. However, there are exceptions to these ideal patterns of action. For example, when a teacher initiates a venture with a question or an assertion which permits students to react in a large variety of ways. A teacher may explain to the class that they are going to focus on the problem of population control and subsequently permit students to focus on those aspects of the problem which they find most interesting.

It is important to note that when we refer to the group-regulated situation we are including the teacher as a member of the group, so that should he seek clarification

or expansion on a topic from a student, he is fulfilling his role as a member of the group, and such instances should not be interpreted as indicating a teacher-centered venture. Key indications of teacher-centered ventures will be those where a teacher rejects a student notion out of hand without attempting to assess with the group which course of action should be followed; or when he initiates a venture with a question of a closed type; or when he cuts off a discussion before the rest of the group appear willing.

Recording and Encoding

Coding should be carried out directly in the classroom by one or more observers. Audio recordings should be used to check classifications, and for assistance in coding particular difficult transactions. Ordinarily only those judges observing a situation *in situ* should code from recordings or transcripts of a situation.

NOTE: The examples and instances cited in these guidelines are meant to be illustrative rather than exhaustive in assisting investigators make decisions concerning the identification and classification of ventures.

SACT 1974

Observer: _____ Teacher: _____

Date: _____ Class: _____

Times: _____

Topic or Problem

Major ideas, concepts

Approach (lecture, discussion etc.)

Venture summaries may be recorded on the reverse side of this form.

SYSTEM FOR ANALYZING CLASSROOM TRANSACTIONS
OBSERVATION SCHEDULE

Observer: _____ Teacher: _____

Date: _____ Class: _____

Times: _____

	VENTURES																Overall impressions/ comments
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1. KNOWING HOW 2. KNOWING THAT																	
3. KNOWING THAT in the STRONG SENSE 4. KNOWING THAT in the WEAK SENSE																	
5. EVALUATIVE INQUIRY 6. NON-EVALUATIVE INQUIRY																	
7. TEACHER-CENTERED 8. GROUP-REGULATED																	

APPENDIX B

INSTRUCTIONAL RESONANCE QUESTIONNAIRE

Instructions: This questionnaire has been designed to help you describe how you feel about certain aspects of your social science[1] options class. Please respond as if you were describing yourself to yourself. Do not omit any items! Read each statement carefully then select the response which best describes your reaction to that item. For example, if you strongly agree with the notion expressed in the statement place a circle around SA; if you simply agree place a circle around A, etc.

SA = Strongly Agree

A = Agree

NS = Not Sure

D = Disagree

SD = Strongly Disagree

Please place your name and the date in the spaces provided.

Please try to be as honest as possible. Your answers will not be shown to your teacher or to anyone connected with your school.

NAME: _____

DATE: _____

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[1]Altered to read "social studies" when appropriate.

1.	What we study helps me a lot outside class.	SA A NS D SD
2.	There is no point in studying most of the problems.	SA A NS D SD
3.	The problems we deal with are trivial.	SA A NS D SD
4.	I can see why it is important to study most of the topics.	SA A NS D SD
5.	I never think about what we study after class.	SA A NS D SD
6.	I can't see the purpose in the topics we study.	SA A NS D SD
7.	The topics we study are of little significance to me.	SA A NS D SD
8.	It makes sense to study most of the topics.	SA A NS D SD
9.	The material we study is too hard to understand.	SA A NS D SD
10.	The course is so difficult I've stopped trying.	SA A NS D SD
11.	I find the work a challenge.	SA A NS D SD
12.	I can get through the course with no effort.	SA A NS D SD
13.	The material in the course is too easy.	SA A NS D SD
14.	I have to make an effort to cope with the material in the course.	SA A NS D SD
15.	I don't have to try very hard to get through.	SA A NS D SD
16.	I find it's a stimulating course.	SA A NS D SD
17.	Most of the topics are thought provoking.	SA A NS D SD
18.	I am not very excited by the course.	SA A NS D SD
19.	The topics we study are interesting.	SA A NS D SD
20.	It just isn't a thrilling course.	SA A NS D SD

21. I find it easy to relate to the problems we study. SA A NS D SD

22. I do the work in order to get the credits. SA A NS D SD

23. What we study just isn't very important. SA A NS D SD

INSTRUCTIONAL RESONANCE QUESTIONNAIRE: SCORING KEY

Items 1, 4, 8, 11, 14, 16, 17, 19 and 21 are positive items.

Scoring:
SA = 5
A = 4
NS = 3
D = 2
SD = 1

Items 2, 3, 5, 6, 7, 9, 10, 12, 13, 15, 18, 20, 22, 23 are negative items.

Scoring:
SA = 1
A = 2
NS = 3
D = 4
SD = 5

APPENDIX C

DIRECTIONS PROVIDED TO UNTRAINED OBSERVERS FOR USE OF THE SYSTEM FOR ANALYZING CLASSROOM TRANSACTIONS

The System for Analyzing Classroom Transactions is a multi-dimensional category system designed to provide for the description of the behavioral interaction of teachers and students in the classroom setting. The system focuses upon four instructionally relevant variables, namely, (i) the level of instructional intent, (ii) the conditions of "knowing that," (iii) the form of inquiry, and (iv) the paradigm of activity. It is these variables which comprise the dimensions of the SACT.

As may be seen from the table, each of the dimensions of the SACT may be considered as consisting of two categories. The level of instructional intent may be

The Dimensions and Categories of the SACT

Dimensions	Categories
INSTRUCTIONAL INTENT	Knowing How Knowing That
CONDITIONS OF "KNOWING THAT"	Strong Weak
FORM OF INQUIRY	Evaluative Non-evaluative
PARADIGM OF ACTIVITY	Teacher-centered Group-regulated

viewed as being composed of "knowing how" and "knowing that." A venture (a unit of classroom discourse) is classified as "knowing how" if the intention of the venture is to teach a skill or cognitive process. It is classified as "knowing that" if the intention of the venture is to teach information.

The conditions of "knowing that" may be regarded as either strong or weak. A venture is classified as strong when the knowledge claims in the venture are substantiated, weak when they are not. (If a venture has been coded "knowing how," the "knowing that" cell should be left vacant.)

The form of inquiry may be either evaluative or non-evaluative. Ventures are classified as evaluative when there is an emphasis upon value terms or prescriptive statements, non-evaluative when assertions are descriptive.

The paradigm of activity may be either teacher-centered or group-regulated. A venture is classified as teacher-centered when it is the teacher who is clearly directing the nature of the interaction. When the students, or the students together with the teacher, are directing the nature of the interaction, the venture should be classified as group-regulated.

Keeping in mind the nature of the categories as directed above, use the observation schedule to classify the ventures indicated on the typescript as you listen to

the recording of classroom interaction.

APPENDIX D

CONTENT CLASSIFICATION IN THE CASE STUDIES

During the process of data collection, the observers monitored classes in terms of content classification. Observers were required to write a short descriptor of each venture and to indicate whether a venture had been considered from a perspective which was easily recognizable as reflecting the concerns of one of the social sciences. (All observers were graduate students in the area of social studies education.)

The records provided by the observers and reported here clearly indicate that the "social studies" classes originally identified as employing integrated knowledge codes, and the "social science" classes originally identified as employing collection knowledge codes, continued to reflect the same patterns of knowledge organization throughout the period of data collection.

CASE STUDY I

Case study I was conducted in Winfield School in the village of Winfield, County Wetaskiwin. The classes comprising the case were a Social Studies 20 class and a Psychology 20 class, taught by a male teacher who had completed three years of study at the University of Alberta, and who had two years teaching experience. There were 23 students in the Social Studies 20 class and 16 students in the Psychology 20 class. The students participated in both classes.

The data were collected by observer I.

CASE STUDY I

Social Studies (Integrated Code)

Observation #1. (April 23, 12:40 p.m.-2:00 p.m.)

Class has been working on a unit called "Tradition and Change."

Venture

1. Teacher introduction. Purpose: to consider the characteristics of "progress," and attempt to find out why it is that progress sometimes causes as many problems as it solves.

2. Student opinions of "rock" music.

3. Comparison of music of early fifties and present (having listened to examples).

4. Relativity of likes and dislikes, across time, across cultures. (Anthropological perspective)

5. Can we always say that the newest is the best?

6. In what ways is our society more advanced than those of the past?

7. How has progress been viewed in different historical periods? (Historical perspective)

8. The place of science and the scientific method in progress. (Historical perspective)

9. The results of scientific progress. (Economic, sociological, political perspectives)

10. Coping with change. (Psychological perspective)

11. Biblical forecasts.

12. Increasing speed of change.

13. Can scientific progress help solve any of the problems which it has created? (Perspective of environmental science; economic and sociological perspectives)

14. Specific focus on problems of production. (Economic perspective)

15. Possibilities afforded by space exploration.

16. Difficulties in farming and harvesting the sea related to international relations. (Political science perspective)

17. Summary of recent contributions afforded by "progress."

18. Controlling the quality of progress.

19. Spirit of discovery in scientific exploration.

20. Summarizing venturing—focus on need to control the nature of progress.

Observation #2. (April 25, 12:40-2:00 p.m.)

Topic: Tradition and Change in Religion

Venture

1. Comparison of ecumenism and sectarianism.

2. Christianity as the ethical basis of Western civilization.

3. The evolution of religious ideas.

4. Christian religion in the Roman Empire.

5. The effects of the Edict of Milan.

6. The function of religion as viewed in the middle ages.

7. Schism: the reformation and reformers. (Ventures 2-7 display a historical perspective.)

8. Different interpretations and doubts in the bible.

9. What are some of the things that might explain why there is a movement away from sectarianism and toward ecumenism? (Economic, sociological and political perspectives)

10. Biblical forecasts of reunification of churches.

11. What results might be hoped for as a result of the ecumenical movement? (Economic and sociological perspectives)

12. Differences between some major religious groups (christian).

13. Should the differences be removed?

14. Differences between christian and other religions.

15. In what ways might the ecumenical movement direct its efforts toward improving international relations? (Political and economic perspectives)

16. If there was a universal church, what would we want it to look like?

17. In what ways can we say that Manitou and Allah are similar or different?

18. How does people's conception of god vary? (Anthropological perspective)

19. Are there reasons why it might be impossible for people to accept the same religion?

20. Should priests be celibate?

21. In what ways do science and religion conflict?

22. Would you give up your own religion for ecumenism?

23. Comparison of Mormons and Jehovah's Witnesses.

24. Why do we need religion? (Psychological perspective)

Observation #3. (April 30, 12:40-2:00 p.m.)

Unit: Religion and Social Change

Venture

1. Teacher review of previous class: Emphasizes that the task at hand concerns examining how organized religion may exert an influence on the process of social change. Today's focus—the work of religious missionaries—In what ways have religious missionaries influenced social development?

2. Early missionary work in Canada. (Historical perspective)

3. The validity of the World Book Encyclopedia as a source.

4. How should missionary work be carried out?

5. The accomplishments of missionaries.

6. The cultural conflicts introduced by missions. (Anthropological and sociological perspectives)

7. Missions in modern societies (Mormons).

8. Impact of missionaries upon Aztec culture. (Historical and sociological perspectives)

9. Non-religious aspects of missionaries.

10. The Jesuits in Japan. (Historical and sociological perspectives)

11. Missionaries as the cause of cultural conflict. (Anthropological perspective)

12. The changing nature of missionary work over time. (Historical perspective)

13. Rapid change brought about by missions—stress. (Psychological perspective)

14. Political missions. (Political science perspective)

15. Political involvement of religious missionaries.

16. Cultural relativism. (Anthropological perspective)

17. Need to believe in supreme being. (Psychological perspective)

18. Are there universal rights and wrongs?

19. Do christians have an obligation to spread "the word"?

20. How might missionaries spread the christian message of "love" without destroying existing ways of life?

Observation #4. (May 9, 12:40-2:00 p.m.)

Topic: Education and Change

Venture

1. Teacher summary and introduction. Class to be a continuation of our study of education. Going to try to pay particular attention to how schools may contribute to society.

2. What should the school teach?

3. Other sources of education (i.e., other than school).

4. The credit system and learning.

5. Order and discipline. (Psychological and sociological perspectives)

6. Corporal punishment. (Psychological perspective)

7. Compulsory attendance. (Historical and economic perspectives)

8. The role of the guidance counsellor. (Psychological and economic perspectives)

9. Other sources of advice, guidance.

10. Education and indoctrination. (Political perspective)

11. Need for free schooling in the monetary sense. (Sociological perspective)

12. Languages in schooling (both official languages).

13. Religious studies—in both christian and non-christian senses.

14. "No need for the sonnet" etc..

15. Approaches to teaching in school. (Technological perspective)

16. Advantages of the present structure. (Sociological and political perspectives)

17. Canadian emphases in curricula. (Historical and geographic perspectives)

18. School as only one place to learn.

19. Freedom in school.

20. Role of machines in education.

21. Family life and sex education courses. (Sociological perspective)

Observation #5. (May 14, 10:30-11:50 a.m.)

Topic: Education: Tradition and Change

Venture

1. How important is tradition?

2. Is tradition of particular importance in education?

3. Purpose is to look at education in England and compare with our experience in Alberta!

4. British education adapting to changing circumstances. (Historical and sociological perspectives)

5. Tripartite English system.

6. Student choice.

7. Selection procedures.

8. The role of parents.

9. The benefits derived.

10. The purposes of a school uniform. (Historical perspective)

11. Do students learn more in that kind of system?

12. The preparatory school system.

13. The relationship to the broader social system. (Sociological perspective)

14. Have the school traditions been used beneficially.

15. Corporal punishment. (Historical perspective)

16. Social injustices in the system. (Sociological perspective)

17. Separation of the sexes. (Historical perspective)

18. Sports and recreation.

19. Use of free time.

20. Teacher's role.

21. Lasting effects upon students. (Psychological perspective)

22. The place of clubs and societies in schools.

23. The comprehensive school. (Historical perspective)

24. Would a system like this be good in Canada?

25. Which traditions from England are found in Canada?

26. What are the major differences in teaching between England and Canada?

CASE STUDY I

Psychology (Collection Code)

Note: Throughout the period of observation, teacher and students adhered rigidly to a textbook ("Psychology for Living" by Sorenson and Malm).

Observation #1. (April 23, 10:30-11:50 a.m.)

Venture

1. Try to understand feelings and emotions about ourselves and other people.
2. Factors shaping our concepts of others.
3. Factors shaping our concept of self.
4. The results of poor self-concept.
5. The results of poor concept of others.
6. Needs and self-concept.
7. Inferiority complexes.
8. Lack of awareness.
9. Freud's views on inferiority.
10. Strategies for overcoming inferiority feelings.
11. Relationships with people with poor self-concepts.
12. Do attitudes remain constant?
13. Examining our own attitudes toward things.
14. Relationship between attitudes and behavior.
15. Prejudice—its overt characteristics.
16. Overcoming prejudice.
17. Reviewing venture focusing upon differentiating among feelings, emotions, self-concept and concept of others.

18. The key factor in personality—self-concept.

19. Causes of inferiority feelings—ridicule, criticism, embarrassment.

20. Introvert and extrovert behavior.

21. Symptoms of inferiority feelings—e.g., shyness.

22. Distinguishing between minor and major symptoms.

23. Conceptions of right and wrong.

24. Feelings of depression.

25. Summarizing.

Observation #2. (April 25, 10:30-11:50 a.m.)

Venture

1. Differences between suppression and repression.

2. The characteristics of regression.

3. Differences between reminiscing and regressing.

4. Feelings, concepts and attitudes—are they the same?

5. Are feelings and emotions the same thing?

6. The characteristics of emotion.

7. The characteristics of feelings.

8. What are our "concepts"?

9. The relationship between our concepts and our behavior.

10. Is communication impeded by lack of mutual "concepts"?

11. Inferiority feelings and self-concept.

12. Can self-concept be changed?

13. Relationships between people.

14. Characteristics of "the blues."

15. How ought you to behave toward other people when you have "the blues"?

16. What are attitudes?

17. Attitude formation and change.

18. Attitudes and behavior.

19. The nature of prejudice.

20. The relationship between prejudice and feelings of inferiority.

Observation #3. (April 30, 10:30-11:50 a.m.)

Venture

1. Characteristics of anger.

2. Characteristics of fear.

3. Would it be better to be totally free from "anger" responses, or to have them and control them?

4. Can we eliminate fear?

5. What causes fear?

6. How might we cope with anger?

7. Well-directed and poorly directed anger.

8. Is fear ever a good emotion to have?

9. Is fear conditioned?

10. Anxiety—definition and characteristics.

Interruption—teacher leaves classroom.

11. Are some people naturally more anxious than others?

12. Can we control anxiety and worry?

13. Is guilt a similar concept?

14. W. B. Cannon's theories on anger and fear.

15. The body's physiological emergency system.

16. Ways to avoid becoming angry.

17. Ways to avoid becoming afraid.

18. Personal experiences which have resulted in fears.

19. Are some fears innate—natural?

20. Rational and irrational fears.

Observation #4. (May 9, 10:30-11:50 a.m.)

Venture

1. In what ways can we set about resolving conflict within ourselves?

2. Are snap judgements as good as those that are "thought" out?

3. Can you have divided loyalties?

4. Kindness and cruelty from the same person.

5. The nature of personal satisfaction.

6. Nature of frustration.

7. Relationship between frustration and the fulfilling of needs.

8. Ambition and frustration.

9. Lack of skills and frustration.

10. Possessions and frustration.

11. Frustrations felt by rural and city inhabitants moving to the other environment.

12. Personal responsibility.

13. Adaptation to situations.

Observation #5. (May 14, 10:30-11:50 a.m.)

Note: Continuation of textbook chapter dealing with conflicts and frustrations.

Venture

1. Variety of approaches to making difficult decisions.
2. What do we mean by conflict among loyalties?
3. Conflict between desire and the need to do what is right.
4. What is the meaning of "ethical"?
5. Decisions and mental strain.
6. The nature of internal conflict.
7. High goals and frustrations.
8. Lack of ability and frustration.
9. Ideas of right and wrong.
10. Causes of psychological conflict.
11. Moral decisions (Freud's viewpoint).
12. Conflict and mental imbalance.
13. Romantic and non-romantic love. (Cross-cultural perspective)
14. Ways to avoid and resolve conflicts.
15. Goals.
16. Human behavior, conflict and needs.

CASE STUDY II

Case study 2 was conducted in Salisbury Composite High School, County Strathcona. The classes comprising the case were a Social Studies 20 class and a Sociology 20 class, taught by a male teacher who possessed an M.Ed. degree from the University of Alberta and who had eight years of teaching experience. There were 22 students in the Social Studies 20 class and 14 in the Sociology 20 class. There were no students who participated in both classes.

Data were collected by observer II.

CASE STUDY II

Social Studies (Integrated Code)

Unit of Study: Tradition and Change

Observation #1. (April 22, 9:35-11:00 a.m.)

Topic: Man's influence in creating change.

Venture

1. Management.
2. How to prepare reports.
3. How to make presentations.
4. Teacher summary.
5. Student presentation begins—man's influence upon commercial transaction through his development of the concept of money.
6. The history of money. (Historical perspective)
7. The importance of money. (Economical perspective)
8. Early association of weight and value.
9. Wherein lies the value of money?
10. Scientific discoveries and changing society.
11. Discovery of penicillin. (Perspective of medical science, sociological perspective)
12. Teacher summary of the importance of penicillin.
13. Reactions to the drug.
14. The use and abuse of drugs.
15. Third student led presentation—Social disruption as a change catalyst.

16. Résumé of the work of Gandhi. (Historical perspective)

17. The legitimacy of non-violent protest. (Historical perspective)

18. Comparison of violent and non-violent protest. (Sociological perspective)

19. Teacher summary.

Observation #2. (April 23, 9:30-10:50 a.m.)

Topic: Tradition and Change. (Reports of student projects.)

Venture

1. Management.

2. Résumé of Gandhi's work (teacher).

3. Introduction of project report on the influ- of television. (Historical perspective)

4. Impact of T.V. on people. (Psychological and sociological perspectives)

5. Domination of Canadian television by U.S. (Political science perspective)

6. Advertising and how it affects us. (Psychological perspective)

7. Introduction of student report on the social impact of the plane. (Historical perspective)

8. Impact of plane on warfare.

9. Impact of plane on communications.

10. Student report on atomic energy. (Historical perspective)

11. Present and future consequences of atomic energy. (Economic perspective)

12. Student report on R.C.M.P.. (Historical perspective)

13. The R.C.M.P. in the north. (Sociological perspective)

14. The R.C.M.P. as a unifying influence in Canada.

15. The R.C.M.P. and the native peoples.

16. Student report on Joseph Stalin. (Historical perspective)

17. Reasons for de-Stalinization. (Political science perspective)

18. Student report on biological and chemical warfare.

19. Use in W.W. II.

20. The threat potential of chemical warfare.

21. Reasons for recent use of chemical warfare.

22. Introduction of student report on John A. Macdonald's influence upon early Canadian development. (Historical perspective)

23. Views on federal states.

24. Images of Canada.

25. Federation and Confederation.

Observation #3. (April 24, 9:30-10:50 a.m.)

Topic: Student reports on aspects of Tradition and Change.

Venture

1. Student report on de Gaulle. (Historical perspective)

2. France and her colonies. Racial integration. (Sociological perspective)

3. Algeria.

4. Student report on J. F. Kennedy. (Historical and political science perspectives)

5. The assassination.

6. Bay of Pigs. (Historical perspective)

7. Assassination as a political weapon.

8. Oswald.

9. A conspiracy? (Political science and economic perspectives)

10. Student report on Lincoln.

11. Federal and State's Rights. (Political science perspective)

12. Federal and Provincial rights in Canada.

13. Lincoln's influence in shaping the nation.

14. The slaves: before and after emancipation. (Historical perspective)

15. Student report on Karl Marx. (Historical perspective)

16. Definition of communism.

17. Communism in Canada.

18. Basic tenets of Marxian theory.

19. Thesis and antithesis.

20. Comparison of Marxist communism and Hutterite communes.

21. Human nature. (Anthropological perspective)

22. Various interpretations of communism today.

23. Marx's idea of a brotherhood of man.

24. Student report on John Diefenbaker.

25. Diefenbaker's career. (Historical perspective)

26. Diefenbaker and nuclear weapons.

27. Canada's dependency upon the U.S.. (Political science perspective)

28. Diefenbaker and Stanfield: a comparison.

29. Student report on Winston Churchill.

30. Charisma—a definition.

31. Secret of success.

32. Teacher summary.

Observation #4. (April 30, 9:40-10:50 a.m.)

Topic: Population and Production.

Venture

1. How can we build environments which are conducive to creative activity?

2. Invention as the work of many years and many people.

3. The process of patenting.

4. Invention as a dimension of humanness. (Psychological perspective)

5. Determination and success.

6. Genius—definition.

7. Marriage and profession.

8. Happiness—its sources and consequences. (Sociological perspective)

9. The importance of goals.

10. Teacher evaluation of projects.

11. The value of each case study.

12. The importance of cultural activities.

13. Definition of "transitional economy."

14. Review of Britain's commercial status. (Historical and economic perspectives)

15. Concept of "dumping" of goods.

16. Utopia.

17. Sweden's development. (Historical perspective)

Observation #5. (May 1, 9:40-10:50 a.m.)

Unit: Population and Production.

Venture

1. Question: how can a nation or a province best develop its own natural resources?

2. Meaning of standard of living. (Economic perspective)

3. Standard of living in Great Britain.

4. Agriculture and land-use in Britain. (Geographic perspective)

5. Protection of land in Canada. (Sociological perspective)

6. Strategic and economic perspectives.

7. The meaning of G.N.P. (Economic perspective)

8. Resources: past and present. (Historical perspective)

9. Coal resources in Alberta.

10. Britain's problems in energy production.

11. Britain as the "workshop of the world."

12. Industrial locations. (Economic and geographic perspectives)

13. Labor shortages in Alberta.

Sociology (Collection Code)

Observation #1. (April 22, 12:20-1:50 p.m.)

Venture

1. Going to have a look at the difficulties experienced by unwed mothers.
2. Background on organization for unwed mothers.
3. Involvement.
4. Classification of unwed mothers.
5. Responsibility for the baby.
6. The child's future.
7. Alternatives available to unwed mothers.
8. Mothers lacking initiative.
9. Ages of unwed mothers.
10. The social status of unwed mothers.
11. Giving up the baby—implications.
12. The legal rights and obligations of the father.
13. Maintenance payments.
14. Back to why father shouldn't have legal rights.
15. Proving fatherhood.
16. Pregnancies as the result of rape.
17. Problems after birth. (Psychological perspective)
18. Marriage prospects.
19. Differences between urban and small town situations.
20. The responsibilities of the girl's parents.
21. Effects of various courses of action upon the child.

22. Social, religious and ethnic backgrounds.

23. Adoption and minority children.

24. Abortion as an alternative.

25. The importance of professional counselling.

26. Does the "organization" encourage giving up or keeping the baby?

27. Can men work usefully in such an organization?

28. The consequences of abortion.

29. The importance of preventing unwanted pregnancy.

30. Whose responsibility?

31. The trauma of being an unwed mother. (Psychological perspective)

32. Should adopted children be told who their real parents are?

33. Does your organization encourage an unwed mother to marry the father?

Observation #2. (April 23, 12:20-1:50 p.m.)

Topic: Continuation of discussion on unwed mothers.

Venture

1. The rate of unwed motherhood.

2. The rights of fathers.

3. How serious (sincere) were the guest speakers?

4. Teacher résumé of the problems of the unwed mother.

5. Society's view of the unwed mother.

6. Society's changing attitudes.

7. Sex: as it relates to youth, and older people.

8. The Christian perspective.
9. The defensiveness of the guest speaker.
10. Impact of society's values upon individuals.
11. Effects of peer group.
12. Ostracizing individuals from the group.
13. Man as a social animal.
14. Are individuals really unique?
15. Statutory rape.
16. Guilt feelings of unwed mothers?
17. Do many unwed mothers marry the fathers?
18. Humans as complex beings.
19. Telling children that they are adopted.
20. The importance of home and family background.
21. How does a girl go about getting an abortion?
22. Teacher views on abortion.

Observation #3. (April 24, 12:30-1:50 p.m.)

Topic: The Salvation Army Family Service and the problem of suicide.

Venture

1. Suicide as a social phenomenon.
2. The work of the Salvation Army.
3. The history of the "Army." (Historical perspective)
4. The variety of Salvation Army interests.
5. The Family Welfare Service.
6. The suicide line.
7. Who uses the suicide line?

8. A case of potential suicide.

9. The procedures for handling a potential suicide. (Psychological perspective)

10. The problem of young people who can't talk to parents.

11. High rates of suicide among females.

12. The sincerity of callers.

13. Calls—tracing, answering.

14. Handling overdoses.

15. Handling callers of different ages.

16. The legal aspects of suicide.

17. Reasons for suicide.

18. The financing of Salvation Army activities.

19. Marriage regulations in the "Army."

20. Boy-girl relations in college.

21. The best form of donation.

22. Welfare and the Salvation Army.

23. Miscellaneous calls.

24. Personality requirements.

25. Exploitation of charity.

26. The Religion of the Salvation Army.

27. Pub work.

28. Uniform regulations.

29. Payment regulations.

Observation #4. (April 30, 12:30-1:50 p.m.)

Topic: Social Disorder and Dissent: The social importance of the family.

Venture

1. Civil disobedience in the sixties.
2. In what ways are circumstances different today?
3. What have been the effects of these movements upon teachers and schools?
4. What do we know about family structures in the past?
5. The tools of archaeology.
6. The value of archaeology.
7. The pyramids as a source of information.
8. What information does Canadian architecture provide about the importance we place upon the family?
9. Traditional attachment to the family.
10. Why does the family retain its importance?
11. The economic and social security of the family.
12. Omitted.
13. Omitted.
14. The concept of the "Block Parent."
15. Importance of the family in caring for both the young and the elderly.
16. Consideration of societal treatment of the elderly.
17. Comparison of present and former institutional family goals. (Historical perspective)
18. Teacher outline of future social phenomena to be discussed.

Observation #5. (May 1, 12:00-1:00 p.m.)

Topic: The Family

Venture

1. Family concept: Extended/Nuclear.
2. The importance of the family.
3. The consequences of divorce.
4. Questions being raised about the nature of family and marriage.
5. Contract marriages.
6. Role in marriage.
7. "I loved a woman."
8. Edmonton's high divorce rate—what does it mean?
9. The social impact of the unreality of T.V. and movies.
10. Family breakdown and suicide.
11. The value of divorce.
12. The sources of family and marital difficulties.
13. The importance of taking things for granted.
14. Assignment.

CASE STUDY III

Case study III was conducted in Fort Saskatchewan Senior High School, County Strathcona. The classes comprising the study were a Social Studies 20 class and a Sociology 20 class, taught by a male teacher who was a B.Ed. graudate of the University of Alberta, and who had six years teaching experience. There were 15 students in the Social Studies 20 class and 17 students in the Psychology 20 class. Five students participated in both classes.

Data were collected by observer III.

CASE STUDY III

Social Studies (Integrated Code)

Observation #1. (April 29, 10:15-11:35 a.m.)

Note: This class has been working for approximately eight weeks on problems directly related to the "Population Explosion."

Venture

1. Want to focus on the idea that birth control should be imposed upon those who fall below a certain economic level. (Idea presented in magazine article.)
2. Identifying major points raised by article.
3. Strengths and limitations of the article.
4. Environmental pressures created by expanding populations.
5. Issue of land versus people.
6. Depleting energy resources.
7. Pollution. (Economic perspective)
8. Disease.
9. Climate.
10. Area limitation.
11. Social attitudes toward birth control. (Sociological perspective)
12. Impact of the depression on family size. (Historical and economic perspectives)
13. Birth control—delimitation.
14. Teacher summary.
15. Encouraging large populations in young nations. (Sociological and economic perspectives)

16. Industrialization.

17. Natural and induced birth control.

18. Disease control. (Sociological perspective)

19. The role of education.

20. The pressures of urban living.

21. The rural-urban split.

22. Self-perpetuation of cities. (Political perspective)

23. The importance of the economy. (Sociological and economic perspectives)

24. Communications and transport.

25. Family size and poverty. (Sociological perspective)

26. Standard of living. (Economic perspective)

27. Voluntary and involuntary birth control.

28. Family size and income tax.

Observation #2. (May 1, 10:15-11:35 a.m.)

Venture

1. Consider the value of the ideas of Thomas Malthus as they relate to the population explosion.

2. Arithmetic and geometric expansion.

3. Resources versus people.

4. Simple versus compound interest.

5. Graphing.

6. Malthusian controls. (Historical perspective)

7. Misery and vice.

8. Changing conceptions of morality. (Historical perspective)

9. Idea of survival of the fittest.

10. Desired type of society. (Sociological, economic, political perspectives)

11. Brains versus brawn. (Historical perspective)

12. "Lord of the Flies."

13. "The Black Death." (Historical and sociological perspectives)

14. How might we best cope with the conditions which Malthus claims are inevitable? Assignment.

Observation #3. (May 2, 10:15-11:35 a.m.)

Venture

1. Consider immigration and population problems.

2. Population trends in Canada today.

3. Historical examination of population trends. (Historical perspective)

4. Changing technology.

5. Medical science.

6. Underdevelopment and technology. (Sociological perspective)

7. Natural control.

8. Political involvement.

9. The concept of war. (Historical perspective)

10. The Middle East.

11. Immigration. (Sociological and economic perspectives)

12. The Irish potato famine. (Historical and political perspectives)

13. Canadian population figures.

14. Quotas. (Historical perspective)

15. Food production.

16. The Industrial Revolution. (Historical and economic perspectives)

17. Colonialism. (Historical perspective)

18. Industry and agriculture.

19. Rural exodus. (Sociological perspective)

20. Mechanization of farm.

21. Chinese communism.

22. Future trends in population.

23. Super-cities.

24. Edmonton.

25. Megalopolis.

Observation #4. (May 3, 10:15-11:35 a.m.)

Class began with 20 minute reading period.

Venture

1. Going to pay attention to the population explosion and its influence upon the ecology.

2. Identifying major viewpoints in article which students have just read.

3. Credibility gap.

4. Author's point of view.

5. Influence of nature.

6. Historical viewpoint. (Historical and geographic perspectives)

7. China.

8. Senility.

9. The potato. (Geographic perspective)

10. The process of population equalization.

11. Morality.
12. Abolishing death.
13. Ecology.
14. Famine. (Historical perspective)
15. What do facts prove?
16. Interpretation of population graph.
17. Demography.
18. The meaning of the term ecological.
19. The meaning of the term physiological.
20. Man the free thinker.
21. Birth control.
22. Birth rate and death rate.
23. The concept of zero population growth.
24. Abortion. (Historical perspective)
25. Literacy.
26. The Indian.
27. The importance of education.
28. War and disease.
29. Measles. (Historical perspective)
30. Transportation of disease. (Historical perspective)

Observation #5. (May 8, 10:15-11:35 a.m.)

Religious views concerning the population explosion.

Venture

1-8 Discussion related to problems in the organization of the course.

9. How to make annotated bibliography.

10. Making best use of discussion.
11. Taking notes.
12. Religion as the opiate of the masses. (Anthropological perspective)
13. The function of religion. (Psychological perspective)
14. Eastern views of the significance of life.
15. Western views of significance of life.
16. Life after death.
17. The concept of heaven.
18. Reincarnation.
19. Catholic attitude toward birth control.
20. Christian concept of the family.
21. Taboos. (Anthropological perspective)
22. Nuclear and extended families. (Sociological perspective)
23. T.V. ads—shaping aspirations. (Psychological perspective)
24. Celibacy.
25. The importance of marriage.
26. The nature of love.
27. The importance of emotion.

Sociology (Collection Code)

Observation #1. (April 29, 2:15-3:30 p.m.)

Focus: Societal institutions.

Venture

1. Making a report.
2. What is anthropology?
3. Nature of archaeology.
4. Definition of a control group.
5. Folk practice.
6. Generalization—definition.
7. Hypothesis—definition.
8. Participant observer—definition.
9. The nature of a pre-literate society.
10. Definition of random sample.
11. The nature of social interaction.
12. The nature of social science.
13. Comparison of the social sciences and the social studies.
14. The scientific method.
15. Sociology—its nature.
16. The process of verification—definition.
17. What are basic institutions?
18. Institutions?
19. Religion as an institution.
20. Comparison of eastern and western religions.
21. What would be important institutions to develop after a nuclear war?

22. Identifying initial tasks.
23. Building a society.
24. Law.
25. Religion.
26. Government.
27. Leadership.

Observation #2. (May 1, 1:30-2:50 p.m.)

Focus: Institutions, customs and change.

Venture

1. Institution defined.
2. Fulfilling a role.
3. The essential place of institutions.
4. The meaning of the term "fundamental."
5. Group support and institutions.
6. Tradition. (Historical perspective)
7. Church services and tradition.
8. Religion as an institution.
9. Japanese society.
10. Social change and institutions.
11. Military surrender in Japan.
12. Rural versus city religion.
13. Social living.
14. Interaction.
15. Customs—definition.
16. Identifying important customs.
17. Education.

18. Customs and legal status.

19. Creation of laws.

20. Definition of term "norm."

21. Dress.

Observation #3. (May 2, 2:15-3:30 p.m.)

Major focus: The establishment of institutions and the creation of status and role.

Venture

1. Library work.

2. Introduction of topic.

3. The nature of institutions.

4. Recording.

5. Stationary and unchanging aspects of institutions.

6. Expected behavior.

7. Status.

8. Role.

9. Matriarchal and patriarchal societies.

10. Similarities among institutions.

11. Constitutionality.

12. Assignment of responsibility.

13. Norms (conduct).

14. Loyalty of members.

15. Religious education in schools.

16. Institution versus institutions.

17. Cigarette smoking.

18. Law and religion.

19. Vending machines.
20. Strapping.
21. Cultural symbols.
22. Codes of behavior.
23. The U.S. draft.
24. Ideology.
25. Senator McCarthy.
26. Nazism.
27. Co-operation.

Observation #4. (May 8, 2:20-3:30 p.m.)

Focus: The manifest and latent function of institutions.

Venture

1. Teacher instructions for class.
2. Functions of institutions.
3. Societal objectives.
4. Transmission of knowledge.
5. The nature of latency.
6. The family.
7. Security and welfare functions of family. (Anthropological perspective)
8. Attitudes.
9. Racism.
10. Transference.
11. Values.
12. Sociological surveys.
13. Factor of adaptation.

14. Societal change.
15. Religious change.
16. Ethnic background.
17. Part-time job.
18. Drop-outs.
19. Institutional examples.
20. Comparison of student government and U.N..
21. Associations.
22. The Klein family.
23. Assignment.

Observation #5. (June 5, 2:15-3:30 p.m.)

Topic: Education as an Institution.

Venture

1. Some statistics.
2. Teaching—institutionalized aspects.
3. Learning—definition.
4. Learning—institutionalized aspects.
5. The societal role of the teacher.
6. Instinct in teaching.
7. Trial and error.
8. The nature of schools. (Anthropological and historical perspectives)
9. Primitive societies.
10. Inquiry.
11. Formal education.
12. Informal education.

13. Communications.
14. Skills.
15. Vocations.
16. The nature of socialization.
17. Size of schools.
18. Values.
19. Travel.
20. Narrow conceptions of education.
21. Jobs.
22. Teachers.
23. Characteristics of this school.
24. Importance of informal contacts.
25. School as a reflection of society.
26. "Spares" (free time in school).
27. School as an artifical situation.
28. Compulsory attendance.
29. Protective aspects of schools.
30. School transference to job role.

CASE STUDY IV

Case study IV was conducted in Salisbury Composite High School, County Strathcona. The classes comprising the case were a Social Studies 20 class and a Geography 20 class, taught by a male teacher who was a B.Ed. graduate of the University of Alberta, and who was in his first year of teaching. There were 19 students in the Social Studies 20 class, and 20 students in the Geography 20 class. One student participated in both classes.

Data were collected by observer IV.

CASE STUDY IV

Social Studies (Integrated Code)

Unit: Tradition and Change

Observation #1. (April 22, 8:15-9:35 a.m.)

Topic: Religions.

Observer note: The class was beginning a research topic on religions. Students were given a choice of religions from which they had to select one for investigation. The class was devoted to ascertaining those aspects of the topic which might be usefully investigated.

The major ideas were:

Values and value systems
Changes in religion
Religion as part of culture and society
What is morality?
The individual in relation to his environment (social and physical)
The causes of social change.

Venture

1. Major religions.
2. Method of research.
3. Major problems to consider.
4. Aztec religions.
5. Managerial—assignment of groups.
6. Methods of presentation.
7. Questions of student choice.
8. Creativity.
9. Roman Catholic beliefs.
10. Organization of reports.
11. Library resources—making best use of.
12. Clarifications—sought by students.

13. Problem of tomorrow's exam.

14. Best use of textbooks.

15. Problem of how value systems are related to religious beliefs. (Sociological and anthropological perspectives)

16. The place of religion in society. (Sociological perspective)

17. Differences across cultures. (Anthropological perspective)

18. Distinguishing between culture and society.

19. The nature of religion.

20. Comparison of religion and belief systems.

21. The character of morality.

22. Atheism.

23. The individual in society. (Psychological perspective)

24. Distinguishing among "invention," "diffusion" and "acculturation." (Sociological/anthropological perspectives)

25. Superior societal traits.

26. "What's on the exam?"

27. Problem of textbooks.

Observation #2. (April 24, 8:15-9:35)

Topic: The class carried out a review of an examination written yesterday. The topic was the "Population and Production" part of the Tradition and Change Unit.

Venture

1. What are natural resources?

2. Discussion of 'conservation.' (Economic perspective)

3. Responsibility for sharing. (Political science perspective)

4. Meaning of nation.

5. Economic growth.

6. Population growth.

7. Natural and immigrant growth. (Sociological perspective)

8. Problems of zero-population growth. (Sociological and economic perspectives)

9. Interpretation of a graph.

10. Differential growth. (Sociological and economic perspectives)

11. Energy sources.

12. An energy pact with the U.S.. (Economic and political science perspective)

13. Total world resources.

14. Defining "resources."

15. Interpretation of graph.

16. Standard of living. (Economic perspective)

17. Quality of life. (Sociological perspective)

18. Problems of urbanization. (Sociological perspective)

19. Transportation and communications. (Economic perspective)

20. Trade unions.

21. Employers organizations.

22. Teacher talks about exam answering techniques.

23. Marine resources.

24. Hours of work. (Historical perspective)

25. Relative productivity.

26. Dignity of work.

27. Problems of unemployment. (Sociological and psychological perspectives)

Observation #3. (May 27, 8:15-9:35)

Observer's note: There has been a long period between this and the previous observation since students were engaged almost exclusively in individual library research.

First quarter of class involved review of exam on Religion and Change. Last three quarters of the period was devoted to student presentation on abortion.

Venture

1. The Reformation.

2. The place of the Catholic Church.

3. The feudal system.

4. Change—social, political, economic, cultural.

(First four ventures employed Historical perspective)

5. Definition of "balance of power."

6. Distinguish between sacred and secular.

7. Class structure. (Historical perspective)

8. Distinguish empire and nation-state.

9. Managerial—marking, answer-sheets.

10. Introduction of student presentation on the topic of abortion.

11. General viewpoints on abortion.

12. The nature of the fetus. (Biological perspective)

13. The relationship of mother and child. (Psychological perspective)

14. The right to live/the quality of life. (Sociological and religious perspectives)

15. Teacher summary of arguments raised so far.

16. The legality of abortions.

17. The prevalence of abortions.

18. The rights of the fetus.

19. Which type of person has abortions?

20. If a child is unwanted should it be aborted? (Religious and sociological perspectives)

21. Abortion as a method of birth control.

22. Is abortion a social or a moral question?

23. The father's rights and responsibilities. (Legal perspective)

24. Hypothetical instance.

25. Is the baby part of the mother or a separate being?

26. How difficult is it to handle an abortion? (Psychological perspective)

27. Under what circumstances would you want an abortion?

28. The dangers of self-abortion.

29. Promiscuous sex.

30. Definition of promiscuity.

31. The doctor's place.

32. Teacher summary.

Observation #4. (May 28, 8:15-9:35 a.m.)

Observer's note: Class took the form of three student presentations. 1. The Space Program—should it be cut back? 2. Prisons—should they be abolished? 3. Inflation.

Venture

1. The space program. (Historical perspective)

2. Economic considerations.

3. The space race. (Political perspective)

4. The contribution of satellites.

5. International relations. (Political perspective)

6. Medical by-products of the space program.

7. The concept of an air-bed.

8. Costs of a space program. (Sociological perspective)

9. Possible future benefits.

10. Widespread criticisms of the program.

11. Things which are sacrificed to the program.

12. The pay-off. (Economic perspective)

13. Should prisons be abolished? (New student presentation.)

14. The Chinese approach to prison.

15. The functions of prisons.

16. The effects of prisons. (Sociological and psychological perspectives)

17. Goals of Canadian prisons.

18. Punishment and rehabilitation.

19. Chinese approach to law-breakers.

20. Honesty and human nature. (Psychological perspective)

21. Control of crime.

22. Effectiveness of prisons.

23. Alternative approaches to dealing with criminals.

24. Introduction of student presentation on inflation.

25. Rates of inflation.

26. Causes of inflation.

27. Definition of inflation.

28. Shortages, production and productivity. (Economic perspective)

29. The consumer price index.

30. Unemployment and inflation.

31. Seasonal employment. (Sociological perspective)

32. Global inflation.

33. The particular problems of Japan.

34. Teacher summary.

Observation #5. (May 30, 8:15-9:35 a.m.)

Observer's note: There were two student led discussions. 1. Should governments or individuals yield to kidnapping demands? 2. Problems associated with legalizing "drugs."

Venture

1. Kidnapping—should we yield to kidnap demands?

2. Current kidnappings.

3. Motives for kidnapping.

4. The FLQ crisis. (Political perspective)

5. The legitimacy of the government reaction.

6. Would you yield to kidnap demands?

7. The moral dilemma.

8. The value of a human life.

9. Terrorist demands in Israel.

10. Order and disorder. (Sociological perspective)

11. The relative value of members of society.

12. Introduction of new topic on the use of drugs.

13. The use of drugs throughout history. (Historical perspective)

14. The relationship of the addict to society. (Sociological perspective)

15. The economics of drug trafficking.

16. Alcoholics as drug addicts.

17. The special position of marijuana.

18. The schools and anti-drug laws.

19. Students who use drugs.

20. Comparison of present drug restrictions and the prohibition period. (Historical perspective)

21. Stereotypes.

22. Public reaction to "long-hairs."

23. Prescription and non-prescription drugs.

24. Sources of drugs. (Anthropological perspective)

25. Doctors and drugs.

26. Drugs and behavior control. (Psychological and sociological perspectives)

Geography (Collection Code)

Observation #1. (April 24, 12:30-1:40 p.m.)

Topic: Glaciation

Venture

1. Definition of glacier.
2. Continental and valley glaciers.
3. Formation of glaciers.
4. Corries or cirques.
5. Denudation.
6. Deposition.
7. Comparison of V and U-shaped valleys.
8. Glacial movements.
9. Arêtes.
10. Nunataks.
11. Effects of climate.
12. Plucking.
13. Glacial decay.
14. Icebergs.

Observation #2. (April 25, 12:30-1:40 p.m.)

Topic: Glaciation

Venture

1. Glaciers and glacial erosion.
2. Hanging valleys.
3. Abrasion.
4. Scree or talus slopes.

5. Plucking.
6. Deposition by glaciers.
7. Erratics.
8. Crag and tail.
9. Moraines.
10. Effects upon soils.
11. Different glacial epochs.
12. Effects upon the Great Lakes.
13. Effects upon patterns of communication.

Observation #3. (April 29, 12:30-1:50 p.m.)

Topic: Location of places in Europe.

Venture

1. Europe's major regions.
2. The importance of mountains as barriers.
3. Rivers as communication routes.
4. The Rhine valley.
5. The Paris Basin.
6. The Rhône valley.
7. Winds—the Mistral.
8. Chinooks or Föhn winds.
9. Identifying and locating major cities.
10. Political and natural boundaries.

Observation #4. (May 27, 12:30-1:50 p.m.)

Topic: Weather and Climate

Venture

1. Managerial—presentation dates.
2. How to make report.
3. The value of maps and diagrams.
4. Distinctions between weather and climate.
5. Weather and climate influenced by ocean currents.
6. The movement of air masses.
7. Depressions.
8. "Highs."
9. Reading temperature for weather map.
10. Effects of the Labrador current.
11. Cloud cover and types.
12. Draw a section through an air-mass.
13. Warm and cold fronts.
14. Occlusions.
15. Air-mass movement and the earth's rotation.

Observation #5. (May 30, 11:45 a.m.-12:55 p.m.)

Topic: Atmospheric phenomena. (Student presentations)

Venture

1. Managerial.
2. Definition and description of hurricane.
3. The causes and consequences of hurricanes.
4. Location of global hurricane zones.

5. Hurricanes picking up water.
6. Climate control—seeding.
7. Map exercise.
8. Definition of wind.
9. Causes of wind.
10. Northern hemisphere.
11. Effects of landscape upon wind.
12. Effects of the earth's rotation.
13. Wind systems.
14. Local winds.
15. Winds and man's activities.
16. Definition of "Air Masses."
17. Source regions.
18. Types of air masses.
19. Cold fronts.
20. Precipitation.
21. Stability of air masses.
22. Teacher summary of topic.

CASE STUDY V

Case study V was conducted in Memorial Composite High School, Stony Plain, County Parkland. The classes comprising the case were a Social Studies 20 class and a Geography 20 class, taught by a male teacher who was a B.Ed. graduate of the University of Alberta, and who had 12 years teaching experience. There were 19 students in the Social Studies class and 22 students in the Geography 20 class. Six students participated in both classes.

The data were collected by observer V.

CASE STUDY V

Social Studies (Integrated Code)

Observation #1. (April 30, 10:30-11:50 a.m.)

Topic: The Problem of Overpopulation.

Venture

1. Growth of world population, 30 A.D.-2000 A.D.. (Historical perspective)
2. The concept of "7 billion."
3. Net population increase.
4. The population structure (ages).
5. Life expectancy.
6. Reasons for great population increase.
7. Effects of population increase. (Sociological, psychological and economic perspectives)
8. Distribution of scarce food supplies.
9. Economic aspects of underdeveloped countries. (Economic perspective)
10. Problem alleviation with mechanization.
11. Water supplies. (Political perspective)
12. Pollution problems.
13. Desalinization.
14. Problems of education re overpopulation. (Anthropological perspective)
15. Population density. (Sociological perspective)
16. Urbanization. (Sociological perspective)
17. Air pollution.
18. Urban land use.

19. Suburbia.

20. Suggestions about how cities should grow.

21. Malthus's projections re population and production.

22. Birth control.

23. Restrictions on family size.

Observation #2. (May 2, 10:30-11:40 a.m.)

Topic: Can the world support its growing population?

Venture

1. Meaning of "support."

2. Can we survive without clothing or housing?

3. Is mere survival adequate.

4. The world's diet.

5. The necessity of clothing. (Anthropological perspective)

6. What standard should people live at?

7. Clarifying the meaning of support.

8. Are people who do not enjoy our standard of living happy? (Historical perspective)

9. Should we find what is needed for man's well-being?

10. What should we be keeping people alive for?

11. What new meanings is the word "support" taking on in the light of our discussion?

12. Individual class reactions.

13. Discussion of the objectives of the unit on Population and Production.

14. Does man have the right to devastate the earth in order to support himself?

15. Destruction of the atmosphere.

16. Should we in Alberta use our resources indiscriminately. (Economic perspective)

17. Will population growth affect our use of resources?

18. Why did projections of population growth stop at the year 2000?

19. What is a "concept."

20. Dogs and humans.

21. Reasoning—its characteristics.

22. Dictionary definitions.

23. Student summary.

Observation #3. (May 6, 10:30-11:50 a.m.)

Topic: How our viewpoints are developed and influence our decisions on population and production.

Venture

1. Sources of viewpoints. (Sociological and psychological perspectives)

2. Dilemma of overpopulation—solution based on one viewpoint.

3. Theological viewpoints on birth control and the quality of life.

4. What will the theologian do when there is no alternative to birth control?

5. Comparison of explanations of death given by coroner and priest.

6. Assumptions of viewpoints.

7. Theological viewpoints on natural phenomena.

8. Birth control and religion. (Sociological and psychological perspectives)

9. Divine providence.

10. Economists' views of the problems of population and production. (Economic perspective)

11. What is the major dilemma associated with the whole problem? (Sociological, psychological and economic perspectives)

12. Population increases related to the industrial revolution. (Historical perspective)

13. Relationship between food production and population. (Economic perspective)

14. Value of renewable resources.

15. Why should we conserve fuel?

16. Economic viewpoints. c.f. 10.

17. Why don't oil companies allow new methods of oil use which are less wasteful?

18. Teacher summary.

Observation #4. (May 8, 10:30-11:50 a.m.)

Topic: What are values? How do they relate to population and production?

Venture

1. What are values?

2. Values in relation to drugs. How are they developed?

3. Experience and values.

4. Personal satisfaction and values.

5. Thinking, values and behavior. (Psychological perspective)

6. Parents and your values.

7. Living only for today.

8. Summary of discussion.

9. Relationship of values and knowledge.

10. Planning ahead.

11. Future orientations.

12. Difficulty in reconciling present and future orientations.

13. Meaning of death.

14. Awareness about the world.

15. Having fun and growing up.

16. Foolish actions.

17. Accepting other people's values.

18. Religions and the value of human life.

19. Satanism and human life.

20. "Maoism" as a religion.

21. The nature of hell.

22. Negative views of life.

23. Sacred nature of life.

24. Dying too soon.

25. Religion and abortion?

26. Religious and secular laws.

27. Birth control and religious values.

28. The quality of human life, birth control and abortion.

29. Supreme beings.

30. Freedom of thought.

31. Differing attitudes toward the sanctity of life.

32. Comparison of some Chinese and North American values.

33. Universality of some views concerning life.

Observation #5. (May 10, 10:30-11:50 a.m.)

Topic: Population and production—historical viewpoint.

Venture

1. Techniques of note-taking.
2. Relationship of population and production-lag. (Historic perspective)
3. Origins of life.
4. Projections for population increase.
5. Why is it important that population has increased rapidly in recent years? (Sociological, psychological, economic perspectives)
6. Underpopulation. (Historic perspective)
7. Always been food shortages.
8. Man has limited experience with overpopulation.
9. The underpopulation problems of the United States. (Historic perspective)
10. Immigration as a solution to underpopulation. (Sociological perspective)
11. Does Canada have a population problem? (Economic perspective)
12. Historical perspectives on population.
13. Omitted.
14. Unknown limits of production.
15. The role of education.
16. No need to reach limits. (Economic and sociological perspectives)
17. Constant methods of production in many areas.
18. Little concern shown today for how our ancestors coped with problems. (Historical perspective)
19. The inadequacy of past solutions.

20. Factors militating against change of ideas. (Sociological perspective)

21. Typical human solutions.

22. Slow to learn from other cultures.

23. What is a system of production? (Economic perspective)

24. Land as a resource.

25. Primary resources.

26. Physical resources.

27. Human resources.

Geography (Collection Code)

Observation #1. (April 30, 12:40 a.m.-2:00 p.m.)

Topic: Man and Resources

Venture

1. Knowledge of land underneath the oceans.
2. Effects of continental drift upon man.
3. Geological evidence of continental drift.
4. The creation of diamonds.
5. Location of diamond mines.
6. Man and his resources.
7. Resources defined.
8. Water as a resource.
9. Soil as a resource.
10. Forest lands as a resource.
11. Types of mineral resources.
12. Industrial consumption of resources.
13. Types of energy.
14. Food resources.
15. Have-not peoples.
16. Contrasts between rich and poor. (Economic and sociological perspectives)
17. Poverty.
18. Food supplies in developed and underdeveloped nations.
19. Health problems.
20. World Health Organization.
21. Sharing of resources.

22. Industrial consumption of water.

23. Sources of supply.

24. Omitted.

25. Urbanization in Alberta.

26. Economic activities in Alberta.

27. Exploitation of Alberta's resources.

28. The Tar Sands.

29. How are coal and oil formed?

30. How are mountains formed?

31. Effect of mountain formation on the earth's core.

32. Emergence of volcanoes.

33. Causes of earthquakes.

Observation #2. (May 2, 12:40 a.m.-2:00 p.m.)

Topic: Plate techtonics.

Venture

1. Importance of maps and diagrams.

2. The earth's motion.

3. The earth's "plates."

4. Why do the "plates" move?

5. Recent acceptance of theory of plate techtonics.

6. Demonstration of how continental outlines may be fitted together.

7. The source of the theory.

8. The action at the edges of the plates.

9. Canada as a location for studying the theory.

10. Magnetic properties of rocks.

11. Methods of checking rock samples from the ocean floor.

12. Splitting of the continental mass.

13. Attempts to locate ancient seas.

14. Movement of individual plates.

15. Explanation of plate movements.

16. Formation of rift valleys.

17. Underpinnings of the plates.

18. Methods of calculating thickness.

19. Evidence of "plume" suspected under Hawaii.

20. Definition of "plume."

21. Earthquake readings as a method of locating "plume."

22. Origins of "plumes" in doubt.

23. Evidence of further "plumes" in Africa.

24. Chains of volcanoes as evidence of moving plates.

25. Traces of plate movements—e.g. Vancouver Island.

26. Magnetic fields.

Observation #3. (May 6, 12:50-2:10 p.m.)

Topic: Plate techtonics—application of theory to various natural phenomena.

Venture

1. Summary of theory of continental drift.

2. The limits of the Pacific plate.

3. Differences between ridge, fault and trench.

4. Reasons for earthquakes.

5. Earthquakes in Alaska.

6. Concern of scientists.

7. Predicting activity in the Persian Gulf and Mediterranean area.

8. What kind of earthquake might affect Edmonton?

9. The weakest spots on the earth's crust.

10. Diagramming the Pacific plate.

11. Outlining Atlantic plate on globe.

12. Effects of the earth's rotation on the plates.

13. The influence of the shape of the earth.

14. Credibility of theory of continental drift.

15. What would have caused Africa and South America to split apart?

16. How does continental drift explain the creation of the Himalayas?

17. Popular science as a source of information.

18. How did parents react to the theory?

19. Some recent interpretations.

20. The creation of synthetic diamonds.

Observation #4. (May 8, 12:40-2:00 p.m.)

Topic: Volcanism

Venture

1. Volcanism defined.

2. Volcanism and the age of rocks.

3. Differences in American and European conceptions of a billion.

4. Omitted.

5. Volcanic material on the earth's crust.

6. The importance of volcanoes for life on earth.
7. Volcanoes as a powerful destructive force.
8. The earth's process of cooling.
9. Sources of water in the interior of volcanoes.
10. Gravity and the molten mass.
11. The earth as a single volcano.
12. The sources of the oceans' salt.
13. Parts of Greenland below sea-level.
14. Perspectives of time and space.
15. Teacher summary.

Observation #5. (May 10, 12:40-2:00 p.m.)

Topic: Plate techtonics, earthquakes and volcanic action.

Venture

1. Probable locations of earthquakes and volcanic activity.
2. Yesterday's earthquake in Japan.
3. Teacher accounts for Japanese earthquake.
4. Probable location of next earthquake.
5. Probable location of new volcanoes.
6. Causes of volcanic eruptions.
7. Sources of pressure within the volcano.
8. Reasons for violent volcanic eruptions.
9. Mexico, 1954.
10. Dormant volcanoes.
11. Volcanic pipes.
12. Three types of volcanoes.

13. The buttes in western desert areas of North America.

14. Classification of volcanoes.

15. Pingos.

16. Future importance of pingos.

17. Underwater pingos.

18. Appearance of a pingo.

19. Reasons for the formation of pingos.

20. Location and appearance in other areas.

21. The comparative rarity of eruptions.

22. The formation of Vesuvius.

23. Krakatoa.

24. Mount Pelee.